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THE THEORY OF DISTURBED REFLEXES IN THE PRODUCTION OF SYMPTOMS OF DISEASE.

BY

SIR JAMES MACKENZIE, M.D., F.R.S., ETC.,

DIRECTOR OF THE ST. ANDREWS CLINICAL INSTITUTE.

WHEN we started the Institute for Clinical Research in St. Andrews we recognized that if success were to attend our efforts we must have a clear comprehension of our object, and a definite idea how that object should be attained. We define our object as the

Prevention of the Diseases that are Common amongst the People.

To understand how disease should be prevented it was necessary to know what are the diseases which are common among the people. On inquiry it was found that, except in a small percentage of cases, this knowledge was nowhere to be obtained.

Here, then, the first step to be taken was to know what the diseases are which we wished to prevent.

The next question was how to proceed to get this knowledge. The great majority of the sick suffered from complaints, and showed signs of ill health, but the disease was unknown. In a few cases the disease could be recognized, because medical knowledge had advanced so far as to detect certain signs and symptoms which experience had shown to be due to definite causes. Seeing that the diseases we wished to prevent were for the most part unrecognizable, it would be futile to attempt to prevent them, so that it was manifest an undertaking must start with preliminary inquiry into the nature of the diseases.

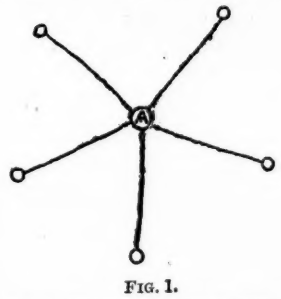

FIG. 1.

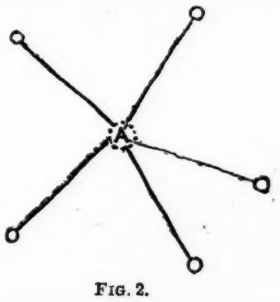

FIG. 2.

FIG. 1 represents a disease completely diagnosed, where A is the agent acting injuriously on the tissues and producing reactions or symptoms, which are represented by the circles at the periphery—as typhoid fever, or conjunctivitis due to a foreign body in the eye.

FIG. 2 represents a disease not fully diagnosed, where, while the symptoms are recognized, the injurious agent A has not been recognized, though its nature can be inferred, as in measles.

Definition of Disease.

In order that our inquiry should be pursued in a logical and systematic manner, we sought to get a clear grasp of what we meant by disease. The definition of an abstract term such as disease would probably be given in different terms, according to the standpoint of the definer. After much consideration and discussion we analysed the phenomena in over 1,000 cases and worked out the following scheme, which revealed the present state of knowledge on the subject, and at the same time afforded a guide for our inquiry.

If we take a simple disease like conjunctivitis, where the cause can be ascertained, we find that the diseased state consists of a foreign body which injuriously affects the tissues, causing certain reactions or symptoms, as pain, lacrymation, redness, blepharospasm. Such a condition may be considered a complete diagnosis and can be represented by the diagram (Fig. 1), where A is the injurious agent and the surrounding circles are the reactions or symptoms.

We found in our inquiry that the complete diagnosis is possible only in a relatively few cases—where the injurious agent has been recognized as due to a foreign body or to a microbe, as in typhoid fever, pneumonia, diphtheria.

In some cases the reactions occur in such definite groups that they can be differentiated, and it can be assumed with reasonable certainty that the disease is caused also by a microbe which has not yet been identified, as measles, small-pox, rabies, etc. These are represented in Fig. 2, in which the injurious agent is represented by a dotted ring.

There were other cases in which the group of symptoms were also capable of differentiation, but in which the nature of the injurious agent was unknown, or a matter of speculation, as in migraine, epilepsy, diabetes, etc. This is represented in Fig. 3, where a point of interrogation represents the injurious agent.

The bulk of patients suffer from diseases in which, so far, it has been found impossible either to recognize the agent or to arrange the symptoms into groups that permit of their clear differentiation from others that they resemble. The nomenclature of such conditions is usually based on the presence of a dominant symptom or of a number of symptoms associated with some organ, such as anaemia, neuralgia, neurasthenia, debility, disordered action of the heart, indigestion. The knowledge of the disease in those cases may be represented diagrammatically (Fig. 4) as a confused heap of symptoms in which it is not possible to obtain a suggestion as to their relation to a common cause.

To the latter group belong probably all chronic diseases, even though the ill health is definitely due to damaged organs which can be recognized by physical signs—as arterio-sclerosis; chronic heart disease, chronic kidney disease, and even consumption and cancer. The reason for including these is that they are probably secondary diseases, the original cause not being capable of recognition.

FIG. 3. FIG. 4.

FIG. 3 represents a disease with a well-defined group of symptoms, but where the nature of the agent is not recognized—as migraine, convulsions.

FIG. 4 represents the vast majority of diseases, where a number of unco-ordinated symptoms are present with no recognizable cause.

The Relation of Symptoms to Disease.

This method of looking upon disease reveals not only the state of our knowledge of diagnosis, but gives a guide in research. It shows that disease is only revealed by the symptoms it produces, and that even in the few diseases where the nature of the agent is understood it can only be identified in the human body by its symptoms.

A consideration of the history of the recognizable diseases shows that the first step in research is to recognize the symptoms. The next step is to group them together, so that one group can be clearly differentiated from those that resemble it. By this method the clinical observer differentiates the disease, it may be, without recognizing the cause. Having reached this stage, he can present a clear-cut problem to, for example, the bacteriologist, who may complete the diagnosis by discovering the injurious agent. The symptoms of the majority of diseases have not yet been clearly differentiated, and there is little prospect of progress being made until this has been done.

This brief review of our present knowledge of disease shows that the chief aim of medical science—the prevention of disease—can never be achieved till we are able to recognize the diseases. Where success has been achieved and disease prevented, it was due in the first instance to the recognition of the symptoms. The clinical observer who obtained this knowledge succeeded because the symptoms were striking in character and easily recognized—as by the presence of a rash or eruption or other sign. It is reasonable to conclude that if we had a better understanding of the mechanism by which less obtrusive symptoms are produced we would get nearer to the detection of the agent producing them. When a person falls ill, the fact is made evident only by the symptoms,

so that the only way in which the disease can be detected is by the recognition of symptoms.

The study of symptoms has been carried on since the dawn of medicine, and from the early days additions have continually been made to their numbers, until to-day the number is so great that no one individual can recognize more than a fraction of them, and methods are ever being invented for the discovery of new symptoms. If our enterprise were but to seek for new symptoms, it would be in vain, for the addition of new symptoms would but add to the confusion of a subject already far too chaotic.

The Evolution of a Science.

All subjects that have attained the position of a science have passed through stages of which the collection of facts was the first. So long as these facts were unco-ordinated their accumulation tended to confusion, and there came to be recognized the need for an ordered arrangement based upon a law of nature.

The history of chemistry is an illustration. The appreciation of Dalton's atomic theory gradually enabled the mass of detail to be classified according to a law of nature. Not only this, but it opened up possibilities and gave guidance to further research, and so enabled the science of chemistry to make remarkable progress.

Symptomatology is in the same confused state as chemistry was before the recognition of the atomic theory; and it calls as urgently for a classification based upon some law of nature that reveals the mechanism of the production of symptoms.

The Classification of Symptoms.

Hitherto there has been no clear conception of the nature of symptoms, and the classifications that have been made have hampered progress and misdirected the course of research. Thus symptoms are usually described from the standpoint of the organ giving rise to them, and specialists devote themselves to the study of the symptoms of individual organs or systems. When a person falls ill nearly every organ of the body may be disturbed, and each specialist has no difficulty in detecting symptoms belonging to his particular branch. In consequence of this we find that confusion of diagnoses which results when a patient consults a number of specialists.

Another source of error arises from the fact that when one organ is diseased its impaired function is revealed not by the organ at fault but by its effects upon the other organs of the body.

It is now many years since I saw the need for a knowledge of the mechanism by which symptoms were produced. I have steadily pursued the subject, and several years ago I dimly recognized that there was some definite law governing this mechanism. I attempted a classification and I was able to group a number of symptoms according to their mechanism, such as a *structural group*, recognized by a physical sign, a *functional group* due to interference with the functions of an organ, and a *reflex group*, due to a peculiar stimulus setting up definite reactions. But there remained a large group, which I recognized somehow or other belonged to the last group, but their mechanism was not clear.

This was the state of knowledge when we began our inquiry. We recognized that it was useless to attempt a research into any particular disease until we had acquired a knowledge of the laws that underlay the production of symptoms, and to that end our chief endeavour was given. We met twice a week; at one meeting we discussed the nature of one particular symptom, and sought for an explanation in the daily routine of examining patients. At the other weekly meeting we discussed in detail the symptoms of individual patients.

The Law Governing the Production of Symptoms.

As time went on we got a better insight into one symptom after another, and we felt we were getting nearer the law of which we were in search, and gradually its recognition dawned upon us. At first we scarcely recognized it when it was put before us because of its extreme simplicity, for we found the law to be *that the vast majority of the symptoms of disease are disturbances of normal reflexes.*

I know quite well that no one who reads this will accept at present the view that this theory will do for clinical medicine what the atomic theory did for chemistry, but I know equally well that when the method of applying it is understood its significance will be appreciated, and it will have a very far-reaching influence on the progress of medicine.

How the Theory was Discovered.

The discovery of this law is the outcome of a long and painstaking search with a definite object in view.

Shortly after entering general practice, over forty years ago, I was impressed with my ignorance of the diseases from which my patients suffered. In the majority the evidence of ill health was confined to the patient's sensations, which I could not interpret. Realizing this, I resolved to see if I could not improve my knowledge, and began to pay more attention to such signs as I could detect, and the principal sensations of which the patient complained. I had not gone far when I realized that these signs and symptoms were so numerous that I could only hope to investigate a limited number. But even when I had selected a few for particular observation I did not know what method to pursue. On reflection I decided upon concentrating my attention on two aspects: (1) *The mechanism by which a symptom was produced;* and (2) *the bearing the cause of the symptom had on the patient's future.*

Of these aspects the latter is, of course, of the utmost practical value to a doctor, and although under the term "prognosis" it has received perfunctory attention, I found that neither the manner in which the subject should be studied nor the individual whose opportunities fitted him for the task had been realized; but with that I do not deal here.

The study of the mechanism by which symptoms were produced led me into several different fields. There was, for instance, the pulsatile movements in the jugular veins and the liver, the movements of the heart in health and disease, and the mechanism of irregular heart action to be considered. I devoted several years to finding out the mechanism of these signs, and the results were an ample reward for the labour and time spent, and helped to make that revolution which has made of human cardiology a totally different subject from what it was when these researches were begun.

The study of the sensations of the patient was much more difficult. I began with the most clamant of all—pain. Hilton's book on *Rest and Pain* was the furthest step that had been taken, but valuable as it was it did not go to the root of the matter. For some years I made little progress—collecting isolated facts but unable to see any reasonable explanation for their causation. In 1888 Dr. James Ross published his article on referred pain, and I at once recognized that he had provided a hypothesis which not only helped to explain much that was obscure but gave a guide for carrying the subject further. In this paper he stated that pain, when arising in an organ, was felt in two ways—first by a pain in the organ itself, and second by a pain felt in the external body wall at a place remote from the organ. The first of these he called splanchnic and the second he called somatic.

I had already gone so far in my inquiry that I recognized the significance of his somatic or referred pain, but I was doubtful of his splanchnic, considering that it also was really referred. He used as an illustration the pain of gastric ulcer when limited to the epigastrium as being a splanchnic pain, but when I examined a patient with a gastric ulcer I found that on a deep inspiration, while the stomach descended, the pain remained fixed.

Though suggestive this was far from convincing, and I sought diligently for other signs, and in 1891 I found a sign which threw much light upon the matter. This was finding a large area of hyperalgesia of the skin over the liver in a patient after an attack of gall-stone colic. This led me to seek for cutaneous hyperalgesia in other cases, and I soon found that it was of frequent occurrence, particularly in affections of abdominal organs. It required, however, a long training to acquire the skill to detect it in many cases.

Shortly after this another sign was recognized—namely, the contraction of the muscles of the abdominal wall, due to disease of an abdominal organ. It had been recognized before, and spoken of as "protective rigidity," but its real nature and significance had never been understood. I watched how portions of the muscle wall of the abdomen would become hard and resistant during the course of a

disease, such as gastric ulcer, appendicitis, gall-stone disease, cholecystitis. I observed it disappear with improvement, until it was not evident, and I could recall it by gently rubbing over it. I noted in patients the sudden contraction of muscle that ensued under certain conditions. Thus, some of my patients described that on the onset of an attack of renal colic the testicle would be dragged up (by contraction of the cremaster muscle).

I described these symptoms of pain and hyperalgesia in consequence of disease of the viscera as a *viscero-sensory reflex*, and the contraction of the muscle as a *viscero-motor reflex*.

There was a large group of symptoms which occurred when patients fell ill from some obscure cause (as infection), such as the feeling of exhaustion, loss of appetite, breathlessness on exertion, palpitation, vomiting, mental depression. These had been vaguely described as toxic symptoms, and I had indeed described them as due to a hypersensitiveness of certain parts of the central nervous system, but I did not clearly realize the mechanism which produced them; this was the stage reached when we started the Clinical Institute, and the matter was summarized in an address I gave on the "Soldier's heart and war neurosis: a study in symptomatology."[1]

The Application of the Theory.

In the description of the theory and its application which follows, some simple observations are given to show the manner in which certain reflexes are disturbed; while we have found it already of value in the interpretation of our patients' symptoms, we recognize that there is required a much better knowledge of reflexes before the theory can be used in a systematic manner. The illustrations therefore are merely to indicate how it may become of use.

While the stimulus and response parts of a reflex may often be recognized, the mechanism of that part of the reflex in the central nervous system is not yet quite clear. Consequently the diagrams of this part of the reflex do not pretend to represent the actual mechanism.

In attempting so to explain the theory that symptoms arise from disturbed reflexes as to carry conviction we recognize that we are handicapped in that what we take to be facts may not be accepted as facts by the reader, and it would take up too much space and time to give our reasons. When, for instance, I state that exhaustion of heart muscle produces pain and proceed to develop the argument in which that statement is accepted as a fact, the reader may not accept the statement. The observations on which that statement is based have been carried on for many years, during which patients have been watched and the circumstances provoking the pain have been considered, the gradual progress of the case observed, and the conditions at the *post-mortem* examination carefully noted. Another long series of observations have been made to discover the laws that govern the production of pain in all muscular organs—a research, indeed, in which we are still engaged, and which every day tends to confirm the view advanced here. In like manner, when I take it as a fact that exhaustion is due to a disturbance of a vasomotor reflex, it is not possible to give the long series of observations on which the statement is based.

Until we are able to publish the researches into these and other matters involved in this description, I would ask the reader to assume that our facts are proven, so that the explanation of this theory may be understood.

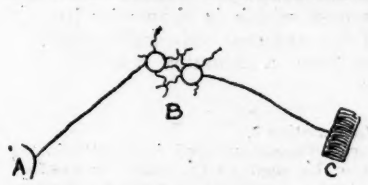

FIG. 5.—Diagram of a simple reflex arc. The stimulus affects the receptor A, from which a nerve passes to a nerve cell at B, where it joins another cell which sends an efferent fibre to C—the effector or structure which gives the response.

Description of a Reflex Arc.

In the reflex arc we recognize the following parts (Fig. 5). A, The receptor or place where the reflex is initiated. An afferent nerve fibre conducts the stimulus to B, the nerve centre. Here the afferent nerve ends in a synapse with one or more nerve cells—the actual number and relationship varying in complexity. The nerve centre in turn sends an efferent fibre to C—the effector or structure, be it muscle or gland or centre of consciousness, which gives the ultimate response characteristic of the reflex.

The whole of this arc is necessary for the production of a simple reflex. Symptoms, or, in other words, alterations in the reflex, may be referable to causes acting upon any part of the arc, but in practice they are found to be mainly confined to alteration in A, the receptor; B, the nerve centre; or C, the effector.

The Part of the Reflex in Life.

The whole economy of the body is built up of a system of organs whose activities depend on reflexes. A flood of stimuli is continually being poured into the system through the skin and special senses, and each stimulus produces a definite reflex on some part of the body. In the deeper tissues of the body stimuli are continually arising and being sent to different organs, which respond by some modification of their activity.

The sources of stimulation, therefore, arise in every part of the body. Organs that at one time are the source of stimulation become at other times the effectors. Thus, when pain is felt, the source (A part of the reflex) may be the peripheral distribution of any sensory nerve, while the brain is the organ which responds (the C part of the reflex). The different organs of the body during periods of activity and quiescence send out stimuli-producing reflexes which modify the activities of other organs—as the heart when it increases its activity in responding to a call for more blood, or decreases its activity in a cessation of effort.

The interplay of these reflexes results in the harmonious action of the organs of the body which we recognize as "health." The disturbance of one or more of these reflexes results in a disharmony which we recognize as symptoms of disease.

Methods by which Disturbed Reflexes are Produced.

There are two ways in which reflexes may be disturbed:

1. By the nature of the stimulus acting on the A part of the reflex arc, the impulse entering through the nervous system.
2. By altering in a positive or negative sense the receptivity of the B and C parts of the reflex, the agent (chemical or thermic) entering through the blood stream.

Disturbance of Reflexes due to the Stimulus Entering through the Nervous System.

The following observations sufficiently illustrate the mechanism by which this kind of disturbed reflex is produced.

Many years ago I had shown that the only serous membrane in which a sensation of pain could be produced was the visceral layer of the tunica vaginalis.

Observation 1.

Dr. Orr, in tapping a hydrocele, tested this statement and noted the sensitiveness of the parietal and visceral layers of the tunica vaginalis. He found he could scratch the parietal layer and the patient feel nothing, but when he touched the visceral layer with the trocar the patient (1) drew back, (2) felt severe pain, (3) became pale, (4) nauseated, and (5) collapsed.

Observation 2.

A man was seized with an attack of renal colic and suffered violent pain in the left side of the abdomen, with contraction of the muscles. He became pale, and sweat poured out; he vomited, and the pulse became soft, and he felt faint.

In Observation 1 the touching of the visceral layer of the tunica vaginalis was the stimulus at the receptive or A part of the reflex. Then followed a variety of responses or effects on the C part of the reflex: (1) A muscular response in the sudden drawing back of the body; (2) the sensation of pain—the centre of consciousness being the response part of the reflex; (3) pallor—a cardiac reflex—due to a stimulation of the vagus, which also probably caused (4) the nausea, and (5) collapse, due to a vasomotor reaction. In Observation 2 we have a similar series of reflexes, these being in addition, the vasomotor reflex causing the sweating, and the vomiting reflex.

Alteration of the Receptivity of the B and C Parts of the Reflex Arc.

The other method, by altering the B and C portions of the reflex arc, comes about through the circulation in the blood of certain agents which affect parts of the arc in a negative or positive way—that is, either increasing or

diminishing the intensity of the impulses during their passage from A to C.

The demonstration of the disturbance of the reflexes through the nervous system is readily understood from such observations as 1 and 2. The demonstration of the circulatory—chemical or toxic—influences is not so easy. Perhaps the best way is to consider the effects of certain drugs whose effects have been sufficiently observed.

Observation 3.—The Effect of Atropine.

An individual who receives a certain quantity of atropine may complain of impaired vision and palpitation. When examined he is found to have a dilated pupil and an increased heart rate, which is abnormally increased on effort.

Each of these effects is due to the drug blocking the passage of normal impulses at C. The pupil of the eye is maintained in an ever-varying balance between dilatation and contraction, responding with great sensitiveness to the stimulus of light. This is because of two reflexes, one presiding over the dilator muscles of the pupil and the other over the sphincter muscles. The atropine blocks the passage of the normal impulses to the sphincter at C and the balance is upset. The heart's activity is regulated in the same way by two sets of nerves, acceleration of rate by the sympathetic, and slowing of rate by the vagus. The heart is like the pupil, ever ready to respond to a demand for more or less blood from the tissues, according to their ever-varying activity. The atropine acts by paralysing the peripheral end of the vagus, or by depressing the C end of the reflex arc, and the uncontrolled sympathetic fibres cause the increased rate.

Observation 4.—The Action of Strychnine.

In the reflex action of muscles in causing the movement of a joint there occurs normally at the same time as the contraction of the muscles a relaxation of the opposing muscles. Thus in Fig. 6 the stimulus arising at A, is diverted at B to C, which causes a contraction of the muscle, and to C', causing a relaxation of the muscle. These reactions are shown by + and −. The effect of strychnine in producing convulsions is by converting the inhibition of the muscles which takes place in a reflex movement of a joint into a contraction of these muscles, as in Fig. 7, where both reactions are seen, represented by + sign.

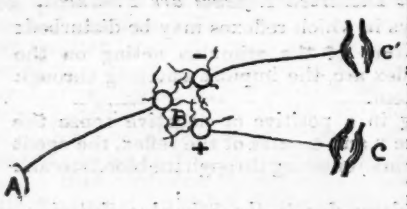

FIG. 6.—Diagram of a muscular reflex. The stimulus from A passes to B, where it affects the nerve cells supplying the muscles C and C'. In response to the stimulus the muscle at C contracts, while the muscle at C' relaxes. The signs + and − indicate the different actions.

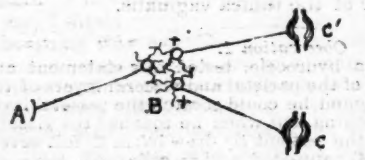

FIG. 7.—Diagram illustrating the effects of strychnine. The response from the stimulus arising at A affects the cells at B differently, so that while the muscle at C contracts the muscle at C' does not relax, but also contracts. This is shown by the − sign in Fig. 6 being now a + sign.

This observation shows the influence of an agent modifying the reflex at the B portion of the arc, and explains the mechanism of the convulsions in rabies as well as in strychnine poisoning. It is to be noted that neither the strychnine nor the toxin in rabies can by themselves initiate a stimulus for the production of a reflex—this arises always from some part of the body through the A portion of the reflex arc, as at the skin. This fact shows that the drug does not cause convulsions, but only modifies the reflex in such a way that the stimulus from A produces the convulsions.

These methods of action probably explain the action of all drugs or toxins which are supposed to act on centres. A great number of drugs are credited with causing vomiting for instance, but the manner in which they act is to render the B or C portion of the arc more susceptible to a stimulus so that a normal stimulus passing into the nervous system affects certain reflexes which have been rendered unduly sensitive.

The following observation shows how a normal act can affect the reflex at B when it is rendered hypersensitive by an agent such as a drug.

Observation 5.

A man with a regular heart, after I had given digitalis, showed irregularities which a graphic record demonstrated to be due to the dropping out of ventricular systoles, the auricular rhythm being unaffected. The digitalis was stopped, and in a few days the heart's rhythm became quite regular, the ventricular systoles having ceased to drop out. Commenting on this fact to the patient, he said he could bring the irregularity back, and I asked him how, and he replied, "By swallowing." I requested him to swallow, which he did, and a ventricular systole dropped out. I took a long tracing, and when he did not swallow the rhythm was regular, but as soon as he swallowed a beat was missed. This was repeated a great number of times. Four days later the heart was quite regular, and swallowing had no effect upon the heart's rate.

Observation 6.

A woman, aged 52, experiences attacks in which she becomes prostrated, suffers severe pain in the head, and vomits. If she lies quite still she does not vomit, but if she is startled by a noise—such as the banging of a door or ringing of a bell—or if she smells tobacco or cooking, vomiting occurs.

In this condition there is manifestly a hypersensitive condition of the B part of the reflex arc, but it is to be observed that vomiting occurs from a stimulus from the periphery, just as the convulsion in rabies and strychnine poisoning.

The Added or Reinforced Stimulation.

In the production of reflexes in disease the reflex often takes place with unusual ease or facility, a slight stimulus producing an exaggerated reflex or calling into play an unusual reflex, as in Observation 5. The reason for this is that the disease disturbs some parts of the reflex arc rendering them more or less susceptible to stimulation. This may happen in several ways.

In certain forms of viscereal disease certain areas of the skin or other tissues of the external body wall show an increased susceptibility to stimulation. Thus, when pressure is applied to the skin of such a strength that in the unaffected part it produces only the sensation of touch or pressure, it produces in these hyperalgesic areas the sensation of pain. The explanation of this disturbance of the normal reflex is that already a stimulus is affecting the arc from the diseased organ A, and the added stimulus of pressure A' is sufficient to produce pain (Fig. 8).

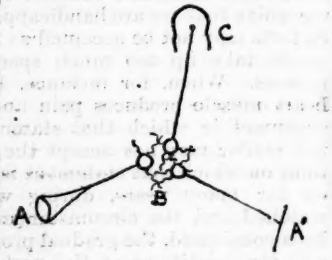

FIG. 8.—Diagram to illustrate an added or reinforced stimulus. The presence of disease at A (say gastric ulcer, a diseased tooth) keeps up a persistent irritation at B, so that a stimulus from A' (the skin or other organ) not sufficient to cause pain by itself, affects the irritated cells at B and produces pain (see also Observations 5, 6, 7).

The contraction of the muscles of the abdominal wall in disease of abdominal organs (the "viscero-motor reflex") is but an exaggeration of the normal reflex which maintains the tone of these muscles. If the gradual disappearance of these contractions be observed it will be found to merge into that state of resistance which we recognize as tone in these muscles, so that the contraction in visceral diseases is but an exaggeration of the normal tone.

The increased sensitiveness which is shown by hyperalgesia of the tissues of the external body wall is capable of giving rise to pain from a stimulus reaching the central parts of the arc.

Observation 7.

A man with advanced aortic disease suffered from attacks of angina pectoris. He had a diseased tooth, which caused a slight degree of pain. During the attacks of angina pectoris, in addition to the pain in the chest and left arm he had pain along the jaw, but the pain was always most severe around the diseased tooth.

In this instance the diseased tooth kept up a continual irritation of the A part of the sensory reflex, and the pain would become more severe when pressure was made on it in chewing, the reflex arc being disturbed by an increase of the stimuli at A. During the attacks of angina pectoris pain was felt along the jaw—where there was already a disturbed reflex—this additional stimulus reaching the arc at B produced an increase of the pain, or, in other words an increased response, at C.

Observation 8.

A man suffered from jaundice with severe attacks of gall-stone colic for several days. The skin of the upper part of the abdomen on the right side was very tender on pressure (hyperalgesia). The pains suddenly ceased and a gall stone the size of a bean was passed by the bowel. The hyperalgesia of the skin persisted, but he suffered pain over the hyperalgesic region on taking food. When the hyperalgesia disappeared he suffered no pain on taking food.

Here, as in Observation 5, a normal stimulus (resulting from the taking of food) on entrance into the central nervous system affected a hypersensitive part of a reflex.

Balanced Reflexes.

There are a great many different kinds of reflexes, some so obscure that their mechanism is not clear. There is one form which from its simplicity illustrates the theory of disturbed reflexes as the basis of symptoms. This is the kind which might be called balanced reflexes, where two systems of reflexes mutually react. This was seen in the description of the reflex contraction of muscles, when at the same time one set of muscles contracts another set relaxes, where strychnine and the toxins of rabies and of tetanus disturb this balance (Figs. 6 and 7). It is also shown in the pupil, where normally the movements of the pupil are exquisitely balanced by the nerves supplying the dilator and sphincter fibres, and where atropine upsets this balance by paralysing the sphincter fibres. It also occurs in the heart, where the play between the accelerator and depressor nerves of the heart results in the delicate regulation of the heart's activity in response to stimuli from the other organs of the body.

In many illnesses the balanced reflex is upset, so that we find the pulse rate a valuable indication of the patient's state. In most toxic cases the rate is increased, possibly by the excitation of the accelerator (sympathetic) part of the reflex. In some cases the toxin stimulates the depressor part, as in typhoid fever, and the effect upon this part of the balanced reflex is seen in certain diseases where the heart's rate becomes very slow, as in the following observation.

Observation 9.

A man 50 years of age began to suffer from sudden attacks of loss of consciousness of brief duration. His pulse was found to be slow, and records—graphic and electrographic—showed that his ventricle was responding only to every second auricular beat. As this is typical of one kind of an over-action of the vagus, an attempt was made to remove this by atropine, which paralyses the peripheral end of the vagus. A hypodermic injection of one-fiftieth of a grain of atropine was followed in ten minutes by the appearance of more beats, and in thirty-five minutes the ventricle responded to every auricular systole.

In this instance the disturbed reflex was due to an over-action of one part of the balanced reflex (the vagus) and the removal of this over-activity at the c portion of the arc by the atropine restored the heart to its normal rhythm.

An example of the disturbance of the balanced reflex, which not only illustrates the mechanism but throws light on a matter of real importance in practice, is afforded by the variation in the heart rate occasioned by the act of respiration. In differentiating the different forms of heart irregularity I recognized one form common in the young, which I called the youthful type of irregularity, and demonstrated that it was produced by the breathing; the heart increased in rate during inspiration and decreased during expiration. This variation was more marked if the individual breathed slowly and deeply.

On inquiring into the significance of this form of irregularity I found it present in young people in perfect health. I found it disappeared when any febrile illness caused an increase in the heart's rate, and it returned when the fever fell and the rate returned to normal. I have used this irregularity for over twenty years as a guide in doubtful cases after recovery from illness, looking upon its presence as a proof that the disease had departed, and that the heart was free from any active process. This view is now justified. Under ordinary circumstances the balance between the accelerator and depressor nerves is so even that a stimulus such as breathing disturbs the balance. The presence of a toxic agent affects the reflex, causing an increase in the rate, so that the slight stimulation from the act of breathing no longer has any effect, and hence the reappearance of the irregularity at the termination of a febrile illness.

The Disturbed Part of the Response.

The tendency to heart-block by stimulating the vagus (as by the use of digitalis) is more apt to occur when the bundle connecting the auricle and ventricle is damaged, and the question arises, Is the effect at c which produces heart-block due to an increase of the vagal activity or an increased susceptibility of the responding organ—that is, the auriculo-ventricular bundle? That the reflex may be impaired by the diminished susceptibility of the recipient organ at c can be inferred from the following observation:

Observation 10.

A man 68 years of age consulted me because he had found that on making a considerable effort, as running upstairs, his pulse, in place of increasing in rate, fell to nearly one-half its rate. I tested him, and found that this was so; I considered that the bundle which conveys the stimulus from auricle to ventricle was damaged, so that while the damaged bundle could convey a stimulus at the rate of 60 or 70 times a minute, it failed to do so when the rate became higher. Subsequent records, graphic and electrographic, confirmed this view.

In this instance the normal balance of the reflex between the augmenting and inhibiting nerves to the heart is disturbed by the damage to the recipient organ.

Multiple Stimuli and Multiple Responses.

The response at c may be due to stimuli originating at different places and in different ways. Thus an abdominal muscle may contract in response to a stimulus from the brain, or from the skin, or from the movements of respiration, or from the movements of the body, or from a visceral stimulus, as in Observation 2.

A single stimulus can give rise to a number of responses—indeed, most stimuli do; we have seen that a cutaneous reflex giving rise to a movement of a joint does so by the contraction of one group of muscles and the inhibition of another group, while Observations 1 and 2 showed that in response to a stimulus a number of reflexes followed.

Multiple Reflexes.

During ill health the patient may complain of a number of symptoms, and the doctor may detect a number of signs. This is due to the fact that the agent which causes ill health disturbs a great many reflexes. To look at these signs and symptoms, each one recorded as an isolated fact, presents such a confused picture that a coherent description of the patient's condition cannot be given. When the individual reflexes are recognized, then the symptoms can be grouped upon a rational principle.

This plan of analysis can be employed in studying the reflexes produced by the impaired functions of organs, or by the specific reaction to the toxins of disease, as well as to drugs, in the manner already described.

The Disturbed Reflexes due to Organic Disease.

One essential question in cases of diseased organs is their functional efficiency. When all the organs are functioning in a normal manner the reflexes pass unnoticed by the individual. When a failure of function takes place the reflexes are disturbed and symptoms appear. It is difficult to recognize the real source of a reflex, for many organs when they fail to function in a normal fashion do not themselves show the signs of failure, but the signs are shown by other organs that are deprived of the material the erring organ contributes to the economy.

While the failure of each organ will give rise to different reflexes the fundamental principles governing the production of the symptom will be the same.

The Disturbed Reflexes due to Heart Failure.

The symptoms produced by heart failure offer a good illustration, as they have been worked out in some detail.

When a healthy individual engages in violent physical effort he will in time produce exhaustion of the heart, so that it no longer supplies sufficient blood to the organs and tissues, and the individual suffers distress. The same thing happens when an individual with a diseased heart undergoes an effort which leads to exhaustion, only in the second instance the amount of effort is less. The signs of heart failure are those of distress and are not to be found by the examination of the heart but by effects of an insufficient supply of blood to other organs. This is well recognized in advanced heart failure when there are

in addition to distress on effort, the physical signs of dropsy and an enlarged liver.

In the great majority of people who suffer from heart failure these physical signs never appear. In them the heart failure is made manifest by a limitation in their response to effort; they are pulled up by distress in some effort they were wont to perform in comfort. This is because of certain reflexes that are set up by organs which suffer from an insufficient supply of blood. The reflexes are of a nature that produce distress of such a clamant kind that cessation of effort is called for. They are mainly of two kinds—the distress associated with (1) breathlessness and (2) pain in a distinctive region.

In healthy people the most frequent evidence of heart exhaustion (as in running) is breathlessness and the accompanying sensation of tightness at the throat and a sense of suffocation. Occasionally there is also a sensation of constriction of the chest with pain across the chest.

What happens in a healthy person is also what happens in one with a weak and diseased heart, one difference being that less effort produces the distress in the latter case and another that pain is a fairly frequent cause of distress.

The mechanism of these two reflexes is quite distinct. Respiratory distress is the outcome of a disturbance of the respiratory reflex on account of the heart being unable to supply purified blood to some part of the respiratory system. I do not discuss further this mechanism here, as it would lead us too far, but everyone recognizes that breathlessness is a sign of heart exhaustion and that it is due to a disturbed reflex.

The other reflex, of which pain is the dominant feature, is a reflex arising from exhaustion of the heart muscle itself. The pain is often accompanied by other reflex signs, as contraction of the intercostal muscles producing the constriction of the chest—sometimes of such extreme violence as to be more dreaded than the pain. Sometimes the mouth fills with saliva, and the pain may be felt not only in the chest but in the arms and along the jaw (Observation 7). These are multiple reflexes comparable with that described in Observation 2.

Observation 11.

A man 68 years of age complains of breathlessness on going up a hill or stairs. Also of pain across the chest, on effort under certain conditions, such as walking out on a cold day or after a full meal. The pain across the chest is preceded by a sense of tightness, or constriction, such as used to pull him up when running a race in boyhood. These signs of limitation have come on gradually, and he noticed his limitation fifteen years ago. There are no physical signs of disease, except some arterial degeneration.

This account is one common to a great many people, in whom the coronary arteries become diseased so that the heart muscle does not receive an adequate supply of blood.

In this case the heart in supplying the active muscles of the legs fails to supply other parts with enough blood, and amongst others the respiratory system is affected, and gives rise to the complex reflex which is called breathlessness. At other times the heart muscle does not receive a sufficient supply of blood, and it gives rise to its peculiar reflex—pain and contraction of the muscles of the chest wall.

In heart exhaustion, then, we have two prominent reflexes—the one arising from a deficient supply of blood to the respiratory organs, and the other arising from exhaustion of the heart muscle. Which of these reflexes first appears on heart exhaustion depends on whether the respiratory or cardiac reflex is first called into play. In the case quoted, under certain circumstances it was the respiratory, and under others it was pain. Occasionally they may both appear.

In certain cases the respiratory reflex is readily produced, as in auricular fibrillation—a condition in which pain is infrequent and rarely severe, while in diseases which limit the supply of blood to the heart muscles pain is readily induced. In the following instance the reaction of the reflex to the different heart states is brought out.

Observation 12.

A man 66 years of age consulted me for pain on walking. The pain at first was only produced by walking, and only on certain occasions—mostly on walking after a meal. The pain was situated across the chest, and was accompanied by a gripping sensation. As years passed the pain became so easily provoked that walking under any circumstances would cause it. The heart was normal in size and the rhythm of the heart normal. One day, when 72 years of age, he called to see me, and said that until recently he could walk 200 yards before the pain compelled him to stop. Now he can only walk 100 yards when he is pulled up, not by pain but by breathlessness. Indeed, since this breathlessness occurred he had not suffered from pain. On examination I found the heart was irregular in its action, the irregularity being characteristic of that due to auricular fibrillation.

This is not an isolated instance, as I have had several cases with a somewhat similar history, but explains an observation I made many years ago, that people with auricular fibrillation do not suffer from severe attacks of angina pectoris.

The Effects of Drugs.

It has already been shown that drugs act by causing a disturbance of reflexes. This way of looking at the action of drugs explains much that is obscure in pharmacology, as the following observation shows.

For a long time it was recognized that digitalis acted in a remarkable manner in some cases of rapid pulse in reducing the rate, while it had no effect in other cases. It was never understood why there should be this difference. I found out about fifteen years ago that in the cases in which it had this slowing effect the heart was regulated by abnormal rhythms—mainly that abnormal rhythm due to the condition now recognized as auricular fibrillation. I have attempted many times to reduce the increased rate of the heart when the rhythm was normal, and invariably failed. I speculated for a long time as to the cause of this difference, but never understood it till the theory of disturbed reflexes made the matter plain.

In infectious diseases—as pneumonia, measles, etc.—the balanced reflex that moderates the heart's action is disturbed by the toxins of the causal agent of disease, so that the rate of the whole heart is increased.

In auricular fibrillation this reflex is not disturbed. When the rhythm is normal the ventricle contracts only to the stimulus that arises from an auricular systole. In auricular fibrillation there is no rhythmic contraction of the auricle, but a continuous fibrillary twitching of the muscle, so that in place of the regular stimulus from the contracting auricle there is a shower of weak stimuli which assail the conducting system between auricle and ventricle, and cause the rapid ventricular rate. Not only is there this difference in the cause of the increased rate, but there is a difference in the condition of the cardiac reflex. In rapid pulse with the normal rhythm the reflex is disturbed by the toxins of the diseased state, so that the digitalis can produce no effect. In auricular fibrillation the reflex is unaffected, so that the digitalis can act upon the vagus portion, and in doing so depresses the conducting mechanism to the ventricle and renders it not so susceptible to the numerous stimuli from the auricle.

The Analysis of Symptoms.

In many diseases all the symptoms on which a diagnosis is based are reflex in origin—in some the reflexes are disturbed by the entrance of the stimulus through the nervous system, and in others the disturbance is through the circulation. To the former belong the symptoms of such diseases as gastric ulcer, renal calculus, gall-stone disease, where the symptoms are of the type described in Observation 2. The symptoms in infections are due to the disturbance of the reflexes through the circulation, as influenza, malaria, typhoid and typhus fevers, measles, and abscess formation, apart from the swelling.

In some diseases we get a mixture of both kinds of reflexes, as in appendicitis, where there is not only the local pain and tenderness of the tissues of the external body wall, with contraction of the muscles of the abdomen, but the feeling of exhaustion, rapid pulse, tendency to vomit. In cholecystitis we get a similar complex.

The need for the more accurate recognition of symptoms is seen when it is considered how difficult it is to diagnose even such seemingly simple affections as gastric ulcer and appendicitis. Though surgeons have been operating for these complaints for many years, the most experienced recognize that in many cases they find they have been mistaken in their diagnosis. This is due in a great measure to the fact that the nature and mechanism of the symptoms of these diseases have never been understood, and the symptoms were never clearly differentiated from those of other diseases which they resemble.

It will thus be seen that symptomatology is like chemistry, where the combination of elements results in the production of a great number of compounds bewildering in their variety. Nevertheless, as in chemistry, when they are subjected to strict analysis they can be resolved into their component elements. When the analysis of symptoms is studied as fully as the analysis of chemical compounds have been studied, then it will be possible to group the disturbed reflexes in an orderly manner. The next step then will be to find out the agents capable of provoking the different reflexes, so that we get nearer to the immediate cause of disease.

The employment of this method of investigation is but a return to those methods of clinical research which were so fruitful in their results in the past, especially during the early half of the nineteenth century. To realize how great the progress was during that period we have to consider the discoveries associated with the names of Addison, Bright, Graves, Adams, Stokes, Cheyne, Paget, Hodgkin, and Jenner. These observers employed the most useful of all weapons in research—the trained senses. What we aim at is to recognize the methods which these great observers employed, and by improving and refining their methods restore clinical medicine to the van of research.

Structural and Functional Symptoms.

A certain number of symptoms are due to structural changes and functional derangements. These are generally shown by physical signs, and are due to departures from the normal in various ways, as in alteration in the size and shape and consistence of organs, changes in the colour, as pallor, modification of the sounds of the heart and lungs. These are not dealt with here, but will have to be reconsidered in view of this theory of disturbed reflexes, because many apparently structural and functional signs are really disturbed reflexes, or are produced by disturbed reflexes.

A Preliminary Note
ON
THE HISTO-PATHOLOGY OF EPIDEMIC (LETHARGIC) ENCEPHALITIS.*

(With Special Plate.)

BY

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INTRODUCTORY.

IN a previous communication on the same subject published in collaboration with Miss Helen Ingleby, M.B., mention was made of a granular, pigment-like material occurring in the nerve cells of regions of the central nervous system where brown or black pigment is not usually found. It was also pointed out that in certain nerve cells small round or oval bodies had been detected, in the middle of which a granule could be seen. The optical impression of such an appearance, when present in Bielschowsky or Nissl preparations, was that of a sort of whitish halo surrounding each granule.

When that note was written no more detailed description of these pictures was given, both because it was meant to be only a short comment on a demonstration of preparations and because I was still uncertain as to the significance of such appearances. It was only later on that a careful examination of a great number of specimens convinced me that I had under observation something not, as far as I knew, hitherto described either in epidemic encephalitis or in other diseases of the central nervous system. As, however, the doubt of an optical illusion could not be entirely dispelled, no further communication was made on the subject, and I waited for an opportunity of somehow strengthening my conviction. This presented itself under the form of a few preparations I was able to obtain recently in Paris through the kindness of Dr. H. Durand, Chef de laboratoire of Professor Netter of the Hôpital Trousseau, and of Dr. Trétiakoff, Chef de laboratoire of Professor P. Marie at La Salpêtrière.

Though many of my doubts are still present, the new facts observed are, in my opinion, such as to require control from those interested in the pathology of epidemic encephalitis. I propose, therefore, to give now a brief description of the already mentioned appearances and of the more recently observed facts, reserving any further discussion about the occurrence of the granular, pigment-like material for another paper.

FIRST HISTO-PATHOLOGICAL FINDINGS.

A fairly good idea of the appearances to be described is given by Fig. 1 (special plate), which is a photographic reproduction of a coloured drawing† made from a toluidine blue preparation of material fixed in alcohol and embedded in celloidin.

This large nerve cell was seen in the lower part of the medulla oblongata, near the middle line, a little ventrally to the nucleus of the hypoglossus, of the first case of epidemic encephalitis published in collaboration with H. Ingleby. As clearly shown in the figure, the Nissl substance has undergone an almost complete process of chromatolysis, all that remains of it being still visible at the edges of the cytoplasm and near the nucleus, which, though retaining its form, has become shifted to the periphery of the cell body. The whole of the cell body is beset with a great number of granules easily distinguished in the preparation because of their blue stain contrasting with the purple of the fundamental cytoplasmic framework. The granules are found in the deep as well as in the superficial parts of the cytoplasm, and nearly all of them are surrounded by a minute light area which under moderate magnification looks like a halo, but under very high power and proper illumination appears as a very delicate, though sufficiently well defined, body, whitish or slightly bluish in colour, and irregularly round or oval in form. As a rule there is one granule in each body, though in some of them two granules, arranged like diplococci, can be observed. Most of the bodies are discrete, and only a few appear united in dumbbell-shaped forms. The granules measure about 0.4 μ, their surrounding light areas from 1.4 to 1.8 μ in diameter.

These are the appearances which repeatedly attracted my attention. For the sake of brevity they will henceforth be spoken of as "minute bodies," comprising in this term also the granules which appear to occupy their centre. It must be pointed out here that specimens as plain as that shown in Fig. 1 are very rare. In most instances the "bodies" are seen in altered nerve cells, together with a variable quantity of granular material which becomes stained by toluidine and polychrome-methylene blue in various shades of green. This is mentioned both because it may help other investigators in their search for the "bodies," and because it shows that their recognition is not hampered by the presence, within the nerve cells, of a granular material with which they seem, however, to have some relation.

A good instance of this is given in Figs. 2 and 3, which are likewise photographic reproductions of coloured drawings, the former being made from a toluidine blue, the latter from a polychrome-methylene blue preparation. The large nerve cell shown in Fig. 2 was found in the reticular formation of another section of the same medulla oblongata from which Fig. 1 was drawn. The diseased condition of the cell is clearly proved by the advanced chromatolysis, deformation, and peripheral shifting of the rather opaque and dark nucleus. The middle parts of the cytoplasm are occupied by a number of granules which in the preparation were stained a yellowish-green. Some of them appear here and there surrounded by a very small light area which, up to a point, imparts to them an aspect similar to that of the "minute bodies" which are particularly noticeable in the peripheral portions of the cytoplasm. These do not differ as regards form, staining properties, and situation, from those shown in Fig. 1. Outside the nerve cell two other "bodies," identical with those situated within it, can be recognized on the top of small fragments of protoplasmic material the exact nature of which could not be ascertained. In the same Fig. 2 another nerve cell has been drawn, showing for the purpose of comparison a common process of vacuolization.

The two nerve cells shown in Fig. 3 were drawn from the layer of small pyramids of a section of the first frontal

* Towards the expenses of this research a grant was made by the British Medical Association.

† All figures illustrating this paper were drawn by Mr. W. Pilgrim with the help of the Abbe-Zeiss camera lucida, comp. oc. 8 K, obj. 2 mm. Z., drawing sheet at the level of the microscopic table.

convolution from the alcohol material of the second case of encephalitis published in collaboration with H. Ingleby. Both of them have undergone a more or less advanced process of vacuolization, the vacuoles having been probably occupied by some fatty-like material dissolved by the alcohol fixation and successive treatment for embedding in celloidin. In the smaller cell a few typical "minute bodies" can be seen; in the larger one it is easy to recognize, beside the "bodies," small clumps of a granular material, stained a dark green in the preparation, and also surrounded by a light area similar to that which characterizes the typical "bodies."

FRESH EVIDENCE.

Investigations had reached this stage, but no further progress had been possible, particularly because all attempts to obtain a differential or at least more defined stain of the "bodies" had failed to give satisfactory results. The same can be said of the method commonly used for staining bacteria, their spores and capsules. The question was therefore left in abeyance until the opportunity arose of meeting Netter in Paris. During the conversation we had on the subject the following points were particularly emphasized by him: (1) The similarity existing in certain respects between epidemic encephalitis and certain forms of sleeping sickness on the one hand and rabies on the other. (2) The involvement in almost all cases of epidemic encephalitis of the salivary glands, a fact which he and Dr. Durand could support both from clinical and histo-pathological points of view. (3) His conviction that the direct etiological factor of the disease ought to be looked for in some agent similar if not akin to the Negri bodies.*

Of the preparations shown to me by Durand some were of nervous tissue, and on looking at them I had the rather vague impression of seeing within the nerve cells bodies which reminded me of those seen in my own preparations. Other specimens were from a salivary gland of an acute case of the disease, and these clearly showed in the interstitial tissue zones of small-celled infiltration very similar to that one meets with in the nervous tissue from cases of epidemic encephalitis.

As I was much interested in such an observation Durand presented me with two slides, on each of which were stuck three unstained paraffin sections of this salivary gland. When back in my laboratory the slides were cut in such a way as to obtain six separate preparations, which I stained with toluidine blue, polychrome-methylene blue, Weigert's iron haematoxylin, haematoxylin and eosin. In the areas of small-celled infiltration of three of them "minute bodies" were found similar to those detected by me in the central nervous system. The granules were stained either blue or blue-black according to the method used; their surrounding areas had again the same whitish or slightly bluish appearance as above.

As seen in Figs. 4 and 5 the dimensions only of some of the central granules are somewhat larger than those of the granules noticeable in most of the "bodies" seen both in these specimens and in the nervous tissue. This difference has been a little emphasized in the photographic reproductions illustrating this paper by the fact that Figs. 1 and 2 have had to be reduced by two-tenths, while all others are of the same size as the original drawings. It is interesting to note that some "bodies" are situated within the cytoplasm of the infiltration cells while others lie free in the tissue, or, as in the case of the two extracellular forms shown in Figs. 2 and 5, they appear situated on the top of or attached to some protoplasmic material of not quite definite nature.

The purpose of my visit to La Salpêtrière was to see the preparations of epidemic encephalitis of Marie and Trétiakoff, but particularly "les volumineuses granulations entourées chacune d'un halo clair" described by them in the nerve cells of the substantia nigra, as well as the "inclusions homogènes dans le protoplasme de volumineuses cellules nerveuses du Nouyau Rouge," also observed by them in their case No. 3. It is outside the province of this paper to enter into a discussion of the significance of these inclusions, particularly of the "volumineuses granulations," considered by the authors as a phenomenon "analogue à celui décrit par Alzheimer sous le nom de dégénérescence graisseuse à gros grains," but it should be noted that the fact corresponds to the description given by the authors, though the explanation might perhaps be different.

At La Salpêtrière both Trétiakoff and I looked for the "bodies" in the preparations kindly shown to me by him; but as nothing clear could then be found he gave me the following polychrome-methylene blue specimens for further investigation: (1) A normal preparation of the mid-brain of an individual of about 40 years of age; (2) two sections—one of the optic thalamus and one of the mid-brain—of a case (Shibler) who had died in consequence of a relapse of the malady; (3) one section of the optic thalamus of an acute case (Baudeloque).

In the normal preparation, just as in my own control specimens, I failed to find anything resembling the "bodies." The section of the optic thalamus of the case Shibler was spoiled on the journey, and no use could be made of it; but in the grey matter surrounding the Sylvian aqueduct of the mid-brain section of the same case a few nerve cells were found the protoplasm of which was beset with small clumps of granular, pigment-like material. These had stained a yellowish-green and could be distinguished with sufficient ease from a few "minute bodies" identical with those seen in my own specimens. The preparation of optic thalamus of the acute case (Baudeloque) was also damaged during the journey, but it could be dismounted and restained with toluidine blue. In this specimen, in which the small-celled infiltration was of extreme intensity, neither pigment-like material nor blue granules could be found within the nerve cells, but "bodies" similar to those observed in the salivary gland were seen scattered in the nervous tissue, particularly near areas of perivascular infiltration (Fig. 7). In a few places forms occurred of which the central particle appeared to consist of two granules arranged in pairs as described above, but in this case one only of them was stained blue, while the other had taken a metachromatically red tinge. In regard to the peculiar tetragonal form shown in the same figure and consisting of two relatively larger purple-red and two relatively smaller blue granules, I think it advisable for the time being to reserve any judgement.

GENERAL CONSIDERATIONS.

It is evident that the possible value of my observations is, in great part, connected with the fact that they were made on varied material from different cases. Indeed, it is only the knowledge of the presence of the "minute bodies" within the nerve cells that has made it possible to recognize them outside the nerve cells in the nervous tissue, as well as within and without the cells forming the small-celled infiltration of the salivary gland specimens. On the other hand, this last observation, which by itself would be worthless, has given to my old finding a fresh significance. Of course, the possibility remains that the "bodies" seen in my specimens and in those for which I am indebted to Dr. Durand and Dr. Trétiakoff might be different, in spite of the similarity in aspect and staining properties. But if so, two different suggestions ought to be put forward to explain the presence of peculiar "bodies" in tissues more or less affected by the same disease. And this seems to me the chief point to be borne in mind: the pathological process underlying these observations being the same, so ought their explanation to be.

With this object in view the following three suggestions seem to me worth briefly considering: (1) That the bodies are the result of an optical illusion; (2) that the granules alone are either bacteria or products of a cell degeneration, their bluish or whitish haloes being again an illusion produced either by light or by vacuolization; (3) that the "bodies" are appearances directly due to the presence in the tissues of an agent, cause of the disease.

As to the first supposition, it has already been said how and why it has been the cause of considerably delaying the publication of this paper. However, I wish to point out here and now that such a suggestion could explain perhaps some of my recent observations and the bluish areas surrounding each granule in evidently diseased nerve cells. But this, in any case, only up to a point, as neither pigmented nor vacuolized nerve cells in normal or pathological conditions ever give such a complete illusion, even if highly magnified and looked at by very powerful artificial light. Moreover, some other suggestion ought to be put forward to explain the occurrence within nerve cells of granules which, according to their staining properties,

* Professor Netter and Dr. Durand have kindly consented to the publication of the above statement.

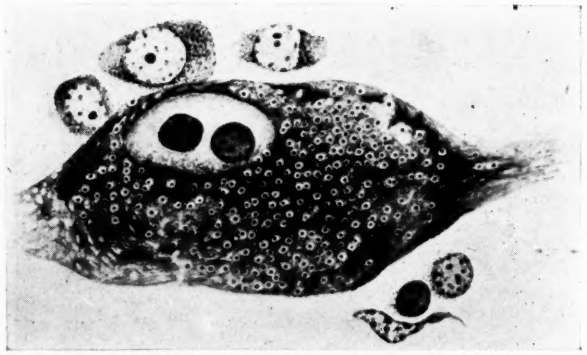


FIG. 1.—Large nerve cell beset with the "minute bodies" described in the text.

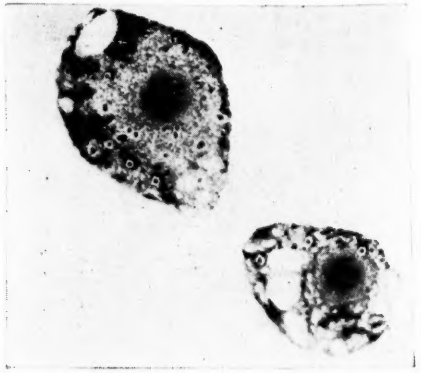


FIG. 3.—Two nerve cells from the cerebral cortex, the smaller one with "minute bodies" only; in the other both "bodies" and small clumps of granular material are shown.

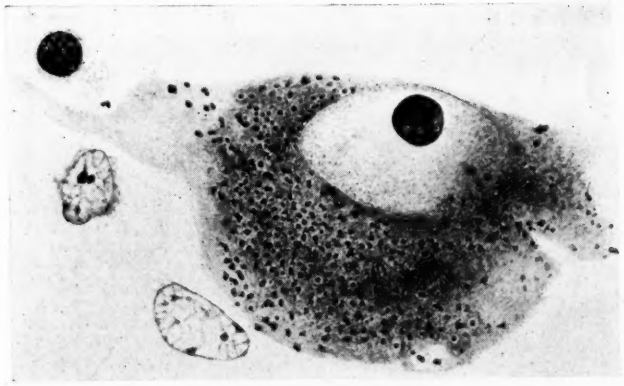


FIG. 6.—Large nerve cell with granular pigment-like material and a few "minute bodies." From the grey matter surrounding the Sylvian aqueduct of a mid-brain preparation of C. Trétiakoff.

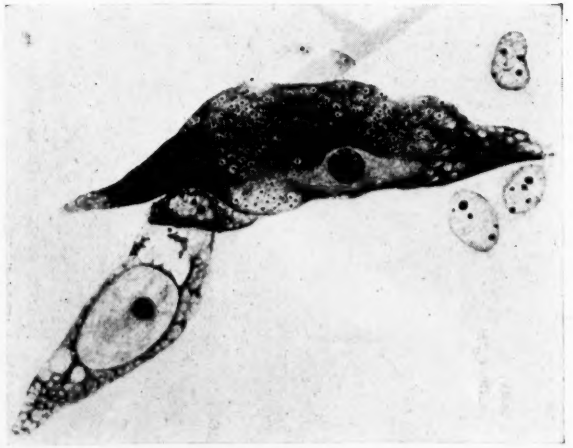


FIG. 2.—Nerve cell with "minute bodies" and granular material. In the other nerve cell a common process of vacuolization is shown.

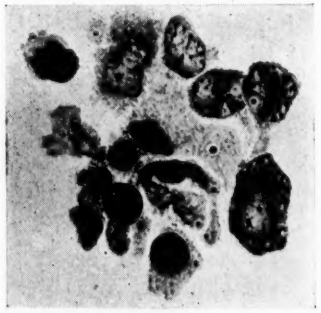


FIG. 4.—"Minute bodies" among and within the infiltration cells of a salivary gland from an acute case of epidemic encephalitis.

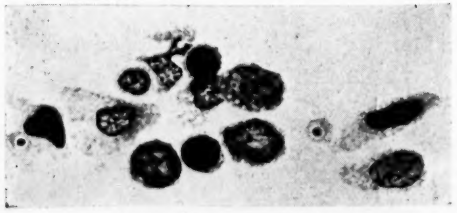


FIG. 5.—Somewhat larger "bodies" seen in another place of the same specimen as Fig. 4.

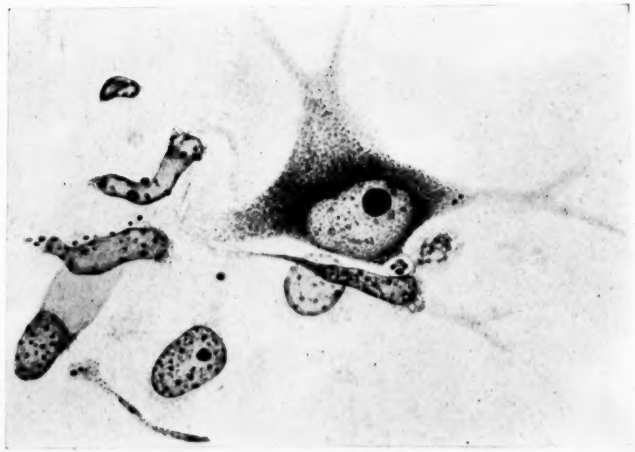


FIG. 7.—"Minute bodies" and a larger tetragonal form seen in the optic thalamus of an acute case of the disease.

R. OLLERENSHAW: ROTATION-DISLOCATION OF THE ASTRAGALUS.

FIG. 1.

FIG. 2.

FIG. 3.

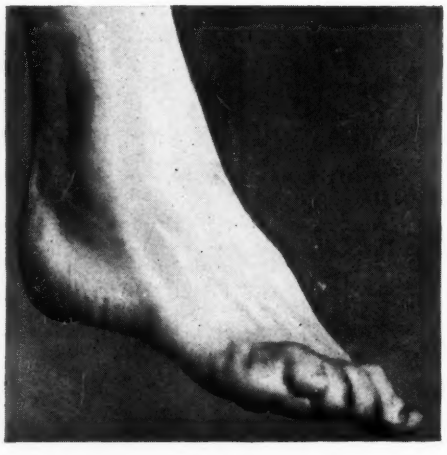


FIG. 4.

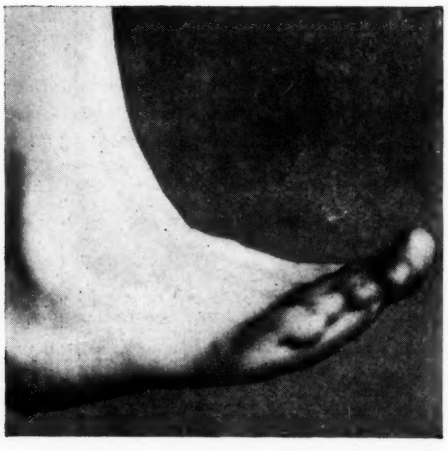
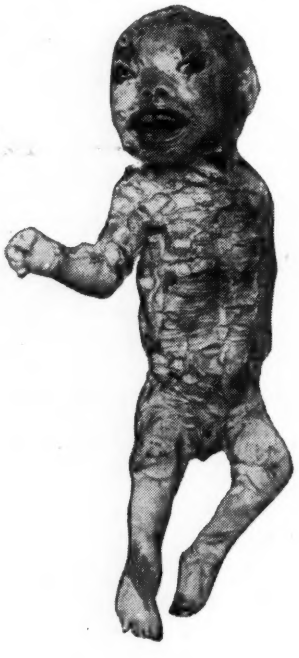


FIG. 5.

J. T. McAUSLIN: "HARLEQUIN FOETUS" (HYPERKERATOSIS CONGENITALIS).



are to be considered as formed either by chromatin or by a similar material.

This takes us to the second supposition, about which, besides some of the reasons just mentioned, I think it useful to remark that bacteriological investigations have been attended, for the present, by negative results, and that, as far as I know, no nerve-cell degeneration has been described resembling the appearances shown in my Figs. 1, 2, 3, and 6.

As to the third hypothesis, I wish to point out that it would link up one with the other the various findings as well as these with histo-pathological changes, which most authors consider extremely like those seen in cases of trypanosomiasis. Those who recollect the aspect of some of the small (internal) forms out of which the Negri bodies appear to result will recognize that between these and the "minute bodies" described in this paper there is a morphological and structural similarity which is at least striking. I quite realize that such a suggestion will acquire value only if other investigators are able to confirm my observations, and particularly if the apparent "bodies" can be found in the nervous or other tissues of animals to which the disease has been successfully transmitted.

SUMMARY.

In the nervous tissue from cases of epidemic (lethargic) encephalitis within and without the nerve cells minute forms have been observed, to all appearance consisting of a central generally basophil particle and of a delicate little stainable body, irregularly round or oval in shape. For these forms the term "minute bodies" is *pro tempore* proposed.

The bodies are generally discrete, and provided with one granule, but dumbbell shaped forms occur as well as others with two central particles arranged in pairs. An as yet not quite definable relation seems to exist between these forms and a granular, pigment-like material occurring within the nerve cells in places where brown or black pigment is not generally found.

Minute forms, similar in shape, structure, and staining properties to those observed in the nervous tissue, have been traced within and without the cells infiltrating a salivary gland from an acute case of the disease.

After discussing the supposition that such findings might be the product of an optical illusion, associated perhaps with degenerative changes caused by the malady, the suggestion is tentatively put forward that they may be due to the presence in the tissues of a living agent, cause of the disease.

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"HARLEQUIN FOETUS" (HYPERKERATOSIS CONGENITALIS).

BY

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(*With Special Plate.*)

THE comparative rarity of this condition appears to warrant the following case being reported; only one case has been recorded here in fifty years.

The mother of the foetus was a girl of 16 years, admitted in labour. On vaginal examination, a breech presentation could be made out, but it was obvious one was dealing with an unusual case. The os was well dilated and the skin of the foetal buttocks had the feel of "crocodile skin." One could not employ a more apt term to describe this, as the hard thickened skin was broken up into numerous irregular patches similar to that of crocodile hide.

The full-time foetus was born dead and weighed 7 lb. It presented a repulsive appearance, as the photographs show. The skin was dead white in colour, cornified and cracked in all directions, making the foetus appear as if clad in a horny armour. The distribution of these changes was universal. When a portion of the hardened skin was removed a red raw-looking area was exposed underneath.

The appearance of the eyes was interesting: no differentiation into the various parts, iris, pupil, etc., could be made out, the eyes appearing as two sacs filled with blood.

An examination was made by Dr. F. J. Browne (Assistant Physician, Ante-natal Department), who was unable to make out any definite morbid changes in the internal organs, except in the thymus, which, although of normal size, contained numerous small scattered abscesses throughout its substance. No spirochaetes could be demonstrated, but the appearance of the thymus was suggestive of syphilis. The microscopic sections were, I regret, not a success, owing to *post-mortem* changes. A Wassermann test in the mother, who made an uneventful recovery, yielded a negative result.

This condition has been confused with congenital ichthyosis, but "it is distinguished from it by the fact that it is present at birth, whereas ichthyosis appears towards the end of the first year of life; and by its distribution, which is universal, whereas ichthyosis is rarely very widespread at first, and hardly ever affects the palms and soles, which this disease always does" (Norman Walker).

I am indebted to Dr. Haig Ferguson for permission to publish this case.

ROTATION-DISLOCATION OF THE ASTRAGALUS.

BY

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(*With Special Plate.*)

DISLOCATION of the astragalus alone is not a very common accident. The usual displacement is of the astragalus forwards—a condition which often results in a compound dislocation.

A more uncommon displacement is of the astragalus backwards, in which event it is to be felt lying between the tendo Achillis and the malleoli. Dislocation of the bone by rotation in its bed is rare, and when it does occur it is not possible to effect a reduction by manipulative measures. In this form of dislocation the astragalus is frequently detached from all its ligaments. Open operation is necessary, and removal of the astragalus has been the general procedure in the recorded cases. Stimson,[1] in his well-known book, describes dislocation by rotation of the astragalus and refers to seven cases. He insists that the description should only include those cases in which the astragalus has undergone rotation round a vertical or an antero-posterior axis, but still remains mainly within the tibio-fibular mortise. Barwell[2] reports a case in which he removed the astragalus and where good function was obtained. He recommends primary removal of the astragalus in all cases of rotation-dislocation in which "certain and sufficient, but not too persevering, attempts at reduction" have failed.

For this reason the present case, in which a rotation-dislocation with complete tearing of all ligaments was operated upon and completely reduced with an ultimate restoration of full function, appears to be a circumstance which it is essential to record in some detail.

W. W., male, aged 42 years, was working at the Manchester Ship Canal Docks on May 20th, 1920, and whilst walking with the right foot well advanced a heavy piece of timber fell from a height and struck the back of his left heel. He was admitted to the Orthopaedic Department of Salford Royal Hospital on the same day.

On examination there was an obvious dislocation of the astragalus, the upper articular surface being palpable below the skin on the outer aspect of the dorsum of the foot. There was also a fracture of the fibula two inches above the tip of the malleolus. *X*-ray examination showed the nature of the dislocation to be a rotation of 90 degrees round the vertical axis (Figs. 1 and 2).

Manipulation was entirely unsuccessful, and operation was decided upon with the idea that astragalectomy would probably be required.

Operation.

A curved incision was made from a point one and a half inches above and behind the outer malleolus curving across the prominence of the astragalus to the mid-line of the foot. The upper and outer surfaces of the astragalus were exposed lying immediately under the skin, and the tendon

of the peroneus tertius, almost completely frayed through, was found crossing the wound. This tendon was retracted inwards, and it was then found that the astragalus was completely free from all its attachments, the posterior surface pointing directly outwards and the head inwards. By forcing the foot into an exaggerated varus position and turning the bone it was possible to replace it so that it occupied its normal position. The foot was then everted, and the torn dorsal ligaments repaired and the peroneus tertius tendon sutured. The fibula fracture was positioned and the wound closed by interrupted sutures, and splinted on a metal shoe with a rectangular foot-piece.

Gentle effleurage was commenced a fortnight later with active flexion and extension of the ankle under supervision to ensure that no inversion of the foot should occur. In the intervals of treatment the foot was retained in the splint. At the end of this time (six weeks after operation) there was very useful movement. Weight bearing was not permitted until three months had elapsed from the date of the injury. Since that time the man has walked comfortably on the foot.

Fig. 3 shows the lateral view after reduction of the dislocation. Figs. 4 and 5 show the range of ankle movement. This case has been very instructive, particularly because it shows that removal of the completely detached astragalus is not essential, and that excellent function with no shortening—a result much superior to that obtained after astragalectomy—may be obtained by this more conservative method.

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ON THE PROBABLE IDENTITY OF RICKETTSIA PEDICULI WITH RICKETTSIA QUINTANA.

BY

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MUNK and da Rocha-Lima (1917)[1] and Brumpt (1918)[2] found rickettsia bodies in lice taken from "healthy persons"; the two former writers named this supposed distinct species found by them *Rickettsia pediculi*, although they stated that it was indistinguishable morphologically and in its distribution in the louse from *R. quintana*, which they found associated with lice that had fed on trench fever patients. They infer that there is a form of rickettsia, infecting the gut of lice, which has no relation to trench or typhus fever. If this is correct, the discovery of these organisms in the lumen of the gut has no necessary significance. My colleague, Dr. Arkwright, and myself have, however, examined numbers of lice taken from civilian clothing in London and have never seen rickettsia bodies except when the insects have fed upon patients who have suffered from trench fever, and it is accordingly conceivable that this disease may have existed unrecognized among the population from which Munk and da Rocha-Lima and Brumpt obtained their lice.

The following account of a case of trench fever occurring in a region where the disease was supposed to be non-existent, in which the rickettsia bodies appeared in lice shortly after the insects were fed upon the patient, is of interest in this respect.

In April, 1920, I experienced while in Warsaw a febrile attack which exhibited the clinical signs of trench fever. The clinical evidence was, moreover, supported by the development of rickettsia bodies in the lice which I took to Poland with me. All the details of the case were under the observation of Professor Wolbach of Harvard, and Professor J. L. Todd[3] of McGill, who agreed (1920) that the symptoms were those of trench fever.

On February 18th I joined Professors Wolbach and Todd in Paris in the capacity of Entomologist to the Typhus Research Commission to Poland of the League of Red Cross Societies. I carried with me stocks of *Pediculus humanus* (*capitis* and *corporis*) which have been under observation and fed only upon myself since November, 1915. Lice from these stocks were used for experimental work in connexion with trench fever by Sundell and Nankivell, the War Office Trench Fever Committee, and the American Red Cross Trench Fever Committee. Since the commencement of the use of these stocks for trench fever research (more than two years ago) lice from them have been frequently tested for the presence of rickettsia bodies, but the insects have remained free; and prior to my visit to Warsaw I had never experienced any febrile attack which displayed the clinical signs of this disease.

We arrived at Warsaw on February 25th, but owing to unavoidable delays were unable to commence laboratory work until the latter end of March, when, as a preliminary step to the use of our stocks of lice for typhus research, a series of control smears were made from the guts and excreta of lice taken from the boxes. Both the American and English stocks were found free of rickettsia bodies. Steps were next taken to obtain a supply of normal Polish lice for comparison. These we were able to obtain by the courtesy of the officials at one of the municipal bath houses where uncleanly and frequently verminous, but not sick, persons were sent for cleansing, their clothing being subjected to hot-air treatment while they bathed. We were informed that lice from this source would be free from suspicion with regard to typhus.

I searched underclothing for lice in this establishment on March 31st and obtained a small supply, larger numbers being forwarded to us a day or two later by the officials in charge of the bath house. The dissection and making of smear preparations of these Polish lice occupied a portion of my time daily up to April 5th, when the few remaining alive were killed and fixed for sectioning. Of course no attempt was made to feed them. Of 151 of these lice 11 (about 7 per cent.) were found to be infected with rickettsia bodies indistinguishable from *R. quintana*. In sections these were seen only in the lumen of the gut; with smears it is not possible to decide definitely whether the cells lining the gut are or are not infected.

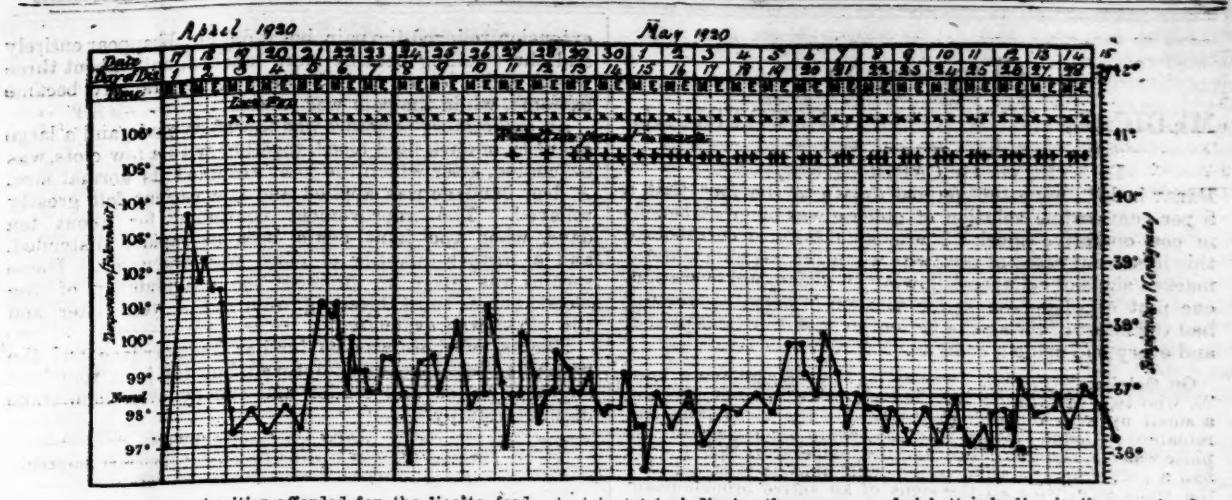
History of Author's Illness.

On April 17th I experienced a sharp febrile attack. Feeling very unwell when I awoke at 6.30 a.m., I took my temperature and found it to be only 97° F., but by 2 p.m. it had risen to 101.7° F. I had a severe frontal headache, and by 9 p.m. my temperature was 103.6° F. I passed a restless night with broken slumber. On April 18th at 8 a.m. the temperature was 101.6° F., and at 10 a.m. 102.3° F.; and arrangements were made for me to go to the American Red Cross hospital at Praga. When I arrived there at 3 p.m. my temperature was 101.4° F., at 6 p.m. 101.3°, and at 8 p.m. 101° F. That night I had but little sleep as I suffered from continuous pains in my bones and joints, from ankles to hips and wrists to elbows, accompanied by heavy sweating. These pains, though of low intensity, were, no doubt on account of their wide area of distribution, peculiarly discomforting. On April 19th my temperature remained at or below normal all day. I felt better, but was somewhat depressed and the sweating continued. At night the pains in my limbs were very acute and continued until about 2 a.m., when they gradually subsided and were replaced by a dull confused sensation in the head accompanied by visual hallucinations whenever I closed my eyes. I sweated heavily and got no sleep until after daybreak. I recognized shin pains as more intense than the general aching of my limbs on this occasion. On April 20th I was better in all respects but very weak. My temperature remained down, and at night the limb pains were slight and discontinuous; the shin pains were, however, more intense by comparison. I slept much better.

In view of the possibility of the attack being typhus (I had been dissecting typhus-infected lice twelve days previously), I refrained from feeding my large stocks of lice at the commencement of the attack, but recommenced to do so when my temperature fell to normal on April 19th as I was convinced that I had not suffered from typhus.

I was very much better on April 21st, and was told that I might leave the hospital on the morrow, but actually left the same afternoon at my own request, as I was very anxious to get back to my quarters in proximity to the laboratory. I suspected that the attack was trench fever and it was important, in order to settle this point, to keep my stocks of lice in the incubator, and make smears of the lice and their excreta from day to day.

That same night (April 21st) I had a renewal of the attack: temperature up to 101° F., with some increase in the intensity of the pains in limbs, but not sufficient to disturb my sleep. The shin pains were again more intense than those in the other bones, and with each recurrence this feature became more apparent. A noticeable feature in connexion with these pains was that, whereas in the primary attack they did not commence until the fever was subsiding and were still acute after it had left me, they now accompanied the febrile wave. Later they commenced prior to a rise in temperature however slight, and on at least one occasion they occurred without any perceptible rise in temperature. Following this renewal of the attack, my temperature rose each night and fell by day for about ten days, and subsequently slight rises occurred at about five-day intervals, some being barely perceptible. Weakness, lethargy and depression tended to increase as the febrile waves became less pronounced. Slight shivering, alternating with flushing and followed by sweating, frequently accompanied the slightest rise



indicates opportunities afforded for the lice to feed. +, ++, +++, indicates the presence of rickettsia bodies in the excreta of the lice and the extent of the infection.

of temperature above normal. Shin and bone pains (chiefly in the knees) were often intense, sometimes accompanied by nausea and headache, causing restlessness and preventing sleep for a portion of the night.

These symptoms occurred for the last time on May 12th, and by May 15th I felt quite fit save for a certain amount of lassitude. This gradually subsided.

No signs of rickettsia bodies were visible in the smears made from the excreta of the lice in my boxes until the eighth day after I recommenced feeding them; then a smear of the excreta from the only box that I was able to keep warm, in the pocket of my pyjamas, until the incubator at the laboratory was available, showed a few rickettsia bodies in several of the fields examined. This box (*a*) was two days ahead of the remaining five boxes in the matter of incubation, though the chances of infection in all the boxes dated from the same time.

The details of incubation after the first infecting meal are as follows: Box (*a*), two days at an estimated temperature of 85° to 90° F. The other five boxes, except during feeding times, remained during this period at about 60° to 65° F. After this all the boxes were kept in an incubator except when the lice were being fed. The temperature of the incubator varied occasionally between the limits of 90° and 100° F., but usually it remained at 93° F. Smears of excreta from box (*a*) showed a quite convincing rickettsia infection on the ninth day, while on the tenth and eleventh days these bodies were present in great abundance in the excreta from box (*a*), and were present in small numbers in most of the smears made from the excreta out of the other boxes. From the twelfth day onwards all the boxes were heavily infected. Smears of guts dissected out of adult lice taken from the boxes showed about 60 per cent. of easily recognizable infections. Out of some fifty sectioned lice taken from the boxes the percentage showing a general infection of the gut was somewhat lower than in the case of the smears, but a prolonged examination of the apparent negative instances often revealed a slight local infection where folds in the gut wall are of most frequent occurrence.

In no case was any evidence of intracellular infection discovered although careful search was made for it. The gut walls, which seem to be so favourable a situation for the development of *Rickettsia quintana*, were, however, generally more or less lined with them, in some cases so uniformly as to give the appearance of palisading.

My blood remained infective for lice after all the symptoms had completely disappeared. Ova from my stocks were washed on May 17th for several minutes in 4 per cent. lysol and then in running tap water for thirty minutes, they were then dried, put into a clean box, and the lice after hatching were fed upon myself: excreta from this box showed the presence of rickettsia bodies on June 11th and 21st.

Ova from my boxes were washed in the same manner on June 11th and placed in two clean boxes to hatch, the lice in one of the boxes being fed by Dr. Arkwright and those in the other by myself. Smears made of the excreta from these boxes showed that the insects fed by Dr. Arkwright were free from rickettsia bodies on June 28th and July 5th, whereas those fed by myself gave positive results when tested on June 28th, July 29th, and August 2nd and 6th. Lice were taken from Dr. Arkwright's box on July 20th, placed in a new box and fed upon myself; excreta from this box remained free from rickettsia bodies for ten days but showed them on the fourteenth and eighteenth days.

Ova of *Pediculus capitis* taken from one of my boxes on August 6th and washed in the manner already described were placed in a new box; the lice which hatched were fed on myself, and the excreta from this box showed a slight infection with rickettsia bodies on September 8th, but subsequent tests of excreta from this box, and also from the one containing lice from Dr. Arkwright's stock, have shown no trace of rickettsia bodies up to mid-October. That is to say, lice fed upon my blood four months after an attack of the disease and three months after the disappearance of all symptoms developed the organisms in their guts, so that it would not seem improbable that the occurrence of rickettsia bodies in the lice from healthy persons was due to the lice having fed on a convalescent from trench fever.

CONCLUSIONS.

1. Trench fever patients may remain capable of infecting lice with *Rickettsia quintana* for at least three months after the cessation of febrile attacks or other obvious symptoms.

2. Persons in apparently good health may therefore infect lice with *Rickettsia quintana*.

3. Lice infected with rickettsia bodies indistinguishable from *R. quintana* were present in Warsaw in 1920, and were associated there with a case of trench fever.

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RECENTLY the French Minister of War asked the Académie de Médecine several questions with regard to the best age and most suitable time of the year for calling young men to the colours. He asked whether it would be better to call them up at the age of 19, 20, or 21. The Académie, in its reply, while pointing out that growth in man does not cease until 25, stated that the age for incorporation in the army might be 20, but that the medical examination at that date should be very strict. The end of April was considered the best time for calling up the class of that year, but if a second call was necessary it was thought that it should be made during September. The best barracks available should be used for housing young soldiers, who should be supplied with a complete change of clothes, to be used when they come in tired and wet. The food, it was stated, should be abundant, varied, and prepared by trained cooks.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

DEXTROSE IN CARDIAC FAILURE.

EARLY in 1912 my attention was drawn to the fact that a 5 per cent. saline solution of glucose was of great benefit in post-operative shock; I was able fully to corroborate this in several cases of my own; when the patients showed marked signs of collapse following an abdominal operation, one pint of a glucose saline solution injected per rectum had the effect of tiding the patient over this critical period, and every one made a complete recovery.

On October 15th, 1920, I was called to see a gentleman, aged 70, who two years previously had contracted pneumonia, and a small unresolved patch at the base of the right lung had remained; I found that the patch had again become active; the pulse was 108, respirations 36, and the temperature 99.6° F.; he had a persistent irritating cough with mucous râles all over the right side, with all the signs of an active bronchopneumonia. For several days the pulse kept between 102 and 108, and intermittent; the respirations were shallow, with numerous moist râles all over the right lung, more particularly at the base; the left lung was comparatively free. He was sleepless owing to the cough.

On October 19th the base of the left lung became involved. The temperature was between 98.4° and 100° F., respirations 48, pulse 104, with marked intermittency. Cough was very troublesome and the patient was sleepless. He remained in this condition for the next few days, but showed signs of getting weaker, and on October 24th he required an injection of hypophysis 1 c.cm., as the pulse showed signs of failure. The temperature was now between 97.6° and 98° F., and respiration was hurried and shallow; the lungs showed no signs of improvement, while the heart laboured with marked arrhythmia. As his nights were the worst, and he was unable to lie down, he received an injection of hypophysis once or twice throughout the night.

About 3.30 a.m. on October 26th I was hurriedly sent for owing to his sudden collapse. The extremities were cold, the pulse almost imperceptible, heart sounds faint and very irregular; the temperature 95° F. With appropriate remedies he revived; oxygen was given. The temperature gradually rose until it reached 97.6° F., the pulse 92, small and intermittent; respirations 42.

On October 30th a 5 per cent. solution of dextrose was administered in teaspoonful doses every fifteen minutes. Throughout the night he suffered from wandering delirium, his speech was indistinct. The respirations would fade away, then become somewhat stertorous, only to die away again. After the continuous exhibition of the dextrose solution for thirty-six hours the respirations had become natural although still rapid, the temperature still subnormal, but the mental apathy completely gone. The heart was regular.

I now gave him hypophosphites with hydriodic acid and 5 drops of the digitalis; the chest began to clear. By November 12th the chest had almost entirely cleared up; the pulse was 72 and regular, and the heart sounds normal.

I have recorded this case in the hope that others will give dextrose a more extended trial in cases of cardiac failure. My experience previously had only been in operative work, and its success was so marked that the idea occurred to me that to give small doses continuously for a lengthened period would achieve the same effect as giving a rectal injection.

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TUBERCULOUS HAEMARTHROSIS OF THE KNEE.

So far as the writer is aware the condition here reported is a very rare one, only a few cases being on record.

The patient, a girl of 15, was admitted to Duke Street Hospital suffering from multiple tuberculous lesions. The glands of the neck were involved; she had tuberculous dactylitis, and there were small lesions in connexion with the epiphyses of the left wrist, right ankle, and right elbow. Wassermann reaction negative. No history nor evidence of haemophilia.

The patient was placed in bed with extension, on account of the condition of the right ankle-joint, which was swollen and tender; but she was allowed up when the condition of the ankle improved.

The right knee had been painful upon occasion from the time of admission, but the pain now became gradually worse and more constant, and, upon slight swelling of the knee-joint occurring, extension in bed was reapplied. The extension relieved the pain, but it did not disappear entirely and the swelling became more marked, until about three weeks after return to bed the swelling rapidly became extreme, while the pain was severe.

An exploratory puncture was therefore made, and a large quantity of dark fluid blood, together with a few clots, was evacuated, after which the joint resumed its normal size. A firm bandage was applied and the patient felt greatly relieved. The improvement continued for about ten days, when the joint again became rapidly distended, and a further quantity of blood was evacuated. Horse serum was given to promote the coagulability of the blood, but a third bleeding occurred a week later and the blood was evacuated.

Thereafter there was no further haemorrhage and the patient's health steadily improved, but the joint remained slightly swollen and tender, and the synovial membrane distinctly pulpy.

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ABDOMINAL TUMOUR FOLLOWING INJURY TO THORAX.

PTE. X, a young man, was admitted to hospital in France labelled "N. Y. D. abdomen." He complained of intermittent pain and discomfort in the upper left abdomen, with occasional vomiting and weakness; these symptoms extended over some months. He gave no history then of any injury; none was suspected, nor was there any apparent evidence of such.

The patient did not look ill. Palpation of the abdomen showed marked resistance over the left hypochondriac region. He was given fluids and watched. The symptoms continued with slight occasional rises of temperature and slightly quickened pulse rate. No diagnosis was made, but possibilities were thought of—none in the right direction, however. A week after admission he was taken to the operating theatre. Abdominal palpation during induction of anaesthesia showed resistance markedly present until he was fully under, when a definite tumour, moving with respiration, could be made out in the uppermost part of the left upper quadrant. On laparotomy I found a large puckered ball of great omentum lightly adherent to the left half of the diaphragm, which was reddened. The omentum was easily unrolled and placed in its normal apron position. The wound being closed and sealed off with aeroplane varnish, a second vertical incision was made in a line external to the nipple, over the seventh and eighth costal cartilages. Pus was found and these cartilages were eroded. The cavity was scraped, flushed, and drained. Both wounds healed quickly and no abdominal symptoms recurred.

On being interrogated the patient subsequently stated that he had been kicked in the left lower chest some months previously. The case, therefore, seems to demonstrate excellently that the "abdominal policeman" was as usual unremitting in attention to duty—in addition to his own regular "beat," he was in readiness to deal promptly with an intruder from an outside source.

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GLANDULAR AND PULMONARY TUBERCULOSIS.

A VERY constant, if not invariable, fact I have observed in my fifty years' experience of tuberculosis is that those members of families with an inherited predisposition to the disease who suffer from cervical gland lesion leading to suppuration do not get pulmonary tuberculosis, or, indeed, any other form of the malady; whereas several other members of the same families without gland lesion, and often the more robust individuals, frequently develop consumption. All my cases have also shown signs that the apex of the corresponding lung had been affected but had recovered. Depression and dullness were present in some cases, but in all there was condensation, as shown by very marked increase of vocal resonance.

Can, then, the absorption of tubercle bacilli from the surface of the mouth when conveyed by the lymphatic vessels and arrested in the glands, as indicated by these glands breaking down, lead to the production there of a type of bacillus capable of curing consumption and of conferring immunity without the bacilli themselves going beyond the glands? That is, I think, what is to be inferred from the above account.

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Reports of Societies.

TREATMENT OF INOPERABLE UTERINE CARCINOMA.

AT a meeting of the Section of Obstetrics and Gynaecology of the Royal Society of Medicine, held on January 6th, with the President, Professor HENRY BRIGGS, in the chair, Mr. PERCIVAL P. COLE read a paper on a series of forty-three cases of inoperable uterine carcinoma treated by the cold cautery method of Percy. He felt impelled to make known his experience of this method, as it had been the subject of considerable criticism in America. Owing to this adverse criticism the method had not been supported in this country, and, although other cautery methods had been employed, the speaker was under the impression that his experience of this particular method was unique. He laid much stress on the value of unvarying assistance, and expressed his obligation to Mr. O. T. Dinnick, who had assisted him at most of the operations.

The technique of the operation could be divided into (1) abdominal—the abdominal cavity being freely opened by subumbilical incision, and the internal iliac arteries, the ovarian vessels, and the round ligaments ligated; (2) vaginal—dilatation of the vagina being first effected by means of a flange and screw dilator, until the insertion of a water-cooled speculum could be made. This speculum had a surrounding water-jacket space, through which water circulated and so protected the vaginal wall from damage by the heated cautery. Redundant growth was removed by a sharp curette and the cautery then directed through the cervix into the uterine cavity. From this time onwards the direction of movements of the cautery were controlled by the assistant, either by verbal directions or by movements, his hand inside the abdomen grasping the fundus of the uterus. Two degrees of heat had been employed—a high or destructive degree and a low or cooking degree; the degree of heat had to be estimated by the abdominal assistant, and might be considered by him sufficient when the heat transmitted through the tissues to his palpating hand was such as to be just bearable. When fundus and cervix had been treated, outlying areas in the bases of the broad ligaments were dealt with, particular stress being laid upon the care necessary to avoid overheating when dealing with the anterior vaginal wall. Failure in this respect had led to the formation of a vesico-vaginal fistula. It was freely admitted that this post-operative complication was most distressing to the patient, and was, in fact, the chief drawback of the procedure. When the pelvic contents had been efficiently treated the pre-operation rigidity had given place to a softness and mobility which were both unexpected and characteristic. Viewed from below the cervix presented a large funnel-shaped crater, the sides of which were quite firm, perfectly dry, and of a peculiar greyish-yellow colour. When the cauterization had been completed the abdominal wall was sewn up in three layers by the assistant. In 1914 ligation of vessels was not undertaken by Dr. Percy, but the ligature of the iliacs, and other vessels to the uterus, was carried out by Mr. Cole on account of severe secondary haemorrhage, which the first few cases clearly showed to be a grave danger. Danger to the ureters had been found to be negligible in ligaturing the internal iliacs, a greater risk being that of wounding the iliac vein as it lay behind the artery.

Gauged by any standard of selection, the type of case dealt with in this series of forty-three was inoperable; the cases were recruited from inoperable cases so certified by practitioners, or admitted to the Cancer Hospital from the out-patient department, their condition being verified in every case by the visiting staff. The almost constant presence of pyometra, as revealed at operation, was commented on, and the extraordinary immediate improvement in the appearance of the patients could best be accounted for on the assumption that pyometra was the causative factor. The comparative rarity of demonstrable glandular invasion had been remarkable, and it was suggested that this freedom was not only apparent but real, for Leitch, in a series of 915 *post-mortem* examinations, had found that metastasis of any kind occurred in only 405, or 45 per cent. In other words, 55 per cent. of cases which had run their course without surgical intervention had died as the result of effects determined by what had remained to the last a local lesion. Dilatation of the ureters—sometimes to an extreme degree—had been frequently noted; and, again, it was pointed out that Leitch in his series of 915 cases had found the kidneys hydronephrotic and the ureters dilated in 75 per cent.

As regards the progress of these cases, the abdominal wall had healed without suppuration in every case. Temperature and shock had been absent, and an immediate improvement in the patient's appearance had been consistently noted, yet several of the patients were over 50, and one was aged 68. A foul discharge might commence on the third or fourth day and exist for a fortnight or so; this was best treated by the administration of a weak iodine douche. Patients had been kept in bed for three weeks, and had left the hospital at the end of a month. Vesico-vaginal fistula had resulted in seven cases; in those cases leakage might have diminished somewhat, but healing had never taken place. This most uncomfortable complication was, however, a frequent result of the untreated disease, and it was urged that vesico-vaginal fistula with freedom from malignant disease was, at any rate, preferable to a vesico-vaginal or recto-vaginal fistula with all the accompaniments of progressive and septic cancerous infiltration. Mr. Cole had no desire to conceal the fact that failures had been frequent, but as the cases dealt with by him could not conceivably be made worse, any improvement was to the good. He exhibited three cases:

(1) A young woman, now aged 35, upon whom operation had been performed nearly three years ago, and examination by members of the Section had failed to reveal the existence now of any demonstrable malignant disease. (2) A woman aged 45, operated on one year ago, was free from discharge and pain since the operation and was now enjoying good health. (3) A woman, now aged 71, operated on three years and three months ago, had a vesico-vaginal fistula, and, although she found the fistula a source of great discomfort, she was yet quite emphatic that life was worth living; she also was recorded as now being free from demonstrable malignant disease.

It had been found latterly that the following up of these cases by the implantation of radium needles had given good results, and Mr. Cole was of opinion that this conjoint treatment by cautery and radium held out to these patients the best chance of palliation and temporary relief from distressing discharges, together with a chance of a very materially increased term of useful life.

Morphine in Labour.

Dr. LOUISE MCILROY read a short communication on the use of morphine in labour, based upon the results of the administration of morphine in obstetrical cases occurring in the officers' wives' section of the 82nd General Hospital, Constantinople. A large number of civilian patients were also admitted for treatment, including Turkish, Greek, and Russian women. The majority of the patients were primiparae, and the cases were not selected, but morphine was given in complicated cases, such as malpresentations, albuminuria. No vaginal examinations were made, except in cases where complications were suspected. No douching of the vagina was carried out. Morphine was given in the form of tablets of morphine sulphate hypodermically in the upper arm. The initial dose was $\frac{1}{6}$ grain, and repeated doses of from $\frac{1}{6}$ to $\frac{1}{4}$ grain were given at varying intervals throughout labour, according to the condition of each patient and her capacity for bearing pain. There was no excitement observed nor mental confusion; the patients slept at intervals and awakened refreshed. The uterine contractions only showed apparent or temporary diminution, and the progress of the labour was found to be hurried rather than delayed. After some experience of the effect of the drug, it was given, not with the primary object of allaying pain, but of shortening labour. Thirst was increased, restlessness was diminished, the third stage was unaffected, and no risks were apparent with regard to the child. No *post-partum* haemorrhage was observed; less fatigue and absence of shock caused a favourable convalescence after labour. The constant attendance of the medical practitioner was not required, as in the administration of scopolamine-morphine. The results were satisfactory and gave this drug a useful place in the management of labour.

Dr. HERBERT WILLIAMSON did not agree with Dr. McIlroy as to the absence of effect on the child; in his experience, if the drug were given within two or three hours before the birth of the child, the latter was born in the condition known as oligopnoea. If left alone, the child generally came round all right.

Dr. HERBERT SPENCER said that in his opinion and in the opinion of many obstetricians before his time, opium, in solid or liquid form, was a much better sedative in labour than morphine. He felt sure that morphine endangered the child's life when given repeatedly up to shortly before its birth. It could not be too strongly

insisted upon that the repeated administration of powerful drugs as a routine measure was neither necessary nor advisable in ordinary healthy women.

Dr. AMAND ROUTH asked how was the shortening of the first stage caused. Was it by the lessening of the rigidity of the cervical muscle as after chloral? Apparently in the second stage there was some muscular relaxation of the pelvic voluntary muscles, and some lessening of the abdominal reflex contractions, but further observations were essential.

Dr. LAPTHORN SMITH said that in all cases of primiparae it was his practice to prescribe a mixture with 30 grains of sodium bromide and ¼ grain of morphine to the dose, to be given as soon as labour began and repeated four-hourly. Nurses had called his attention to the excellent condition of patients after labour in these cases. He repeated the morphine by hypodermic injection when required.

PELVIMETRY IN CONTRACTED PELVIS.

AT a meeting of the Edinburgh Obstetrical Society held on January 12th, with Dr. HAIG FERGUSON in the chair, a paper was read by Dr. DAVID SHANNON, Glasgow, on pelvimetry as an index of treatment in contracted pelvis. His observations were limited mainly to pelves deformed at the superior strait, and the motive of his paper was to endeavour to prove that, except in a few cases, the measurement of any diameter at the pelvis could not be used alone to indicate treatment and to bring forward a method of pelvimetry which could be used as an index of treatment in all cases. The normal minimum of the pelvis had been laid down by Michaelis and Litzmann, but judging from textbooks, in which such a marked variance existed regarding pelvic measurements, their standard had not been accepted, with the result that it was difficult for a practitioner to say when a pelvis was really contracted, and certainly he could not base treatment upon such measurements with confidence. It was very difficult to measure a pelvis accurately, and the deductions in many cases from such measurements could not be trusted sufficiently to guide one as to the best treatment to adopt.

Dr. Shannon illustrated his contentions by referring to a series of 316 cases of contracted pelvis, in which he outlined the treatment carried out. The pelves were grouped in such a way that the conjugates of the superior strait measured the same in each group. For example, in that group in which the conjugata vera measured 3¼ in., 34 per cent. were born spontaneously, but amongst the other cases almost every obstetrical operation was performed. Pelvic measurement, he stated, could be used as an index of treatment, provided the foetal head did not vary in size and consistence, but as it did so often vary it was essential to estimate its size relative to the brim of the maternal pelvis in each case before treatment could be decided upon. On that account, therefore, the foetal head was the best pelvimeter. This fact was appreciated by many obstetricians, notably Müller, Pinard, and Munro Kerr, each of whom had given us a method of determining this important factor. Munro Kerr's method was a distinct improvement on the others, and, with a little practice, could be used as an excellent index of treatment in these difficult cases. This method of estimating the relative size of foetal head and pelvic brim Dr. Shannon proceeded to describe in some detail.

In pressing the foetal head on to the superior strait of the pelvis it was advised to imitate Nature. In pelves of the flat variety downward pressure should be made, so that the sagittal suture lay in the transverse diameter of the pelvic brim. In most cases this was easy, but in some—those in which the occiput was posterior—it was noticed that the head often lay in the oblique diameter, and, in such cases, it had to be changed into the transverse before pressure downwards was made, if the best results were to be obtained. In generally contracted pelves, also, the head did not always lie well placed and in an oblique diameter, and so, in pressing it downwards, care had to be exercised so that the head entered the oblique Nature intended it to enter. These abnormal positions of the head were first noted by palpation and verified later whilst performing Caesarean section by the lower uterine segment incision. If the foetal head was pushed down on to the superior strait carelessly there was a possibility that a certain amount of lateral flexion of the head might take place, with the result that the amount of overlapping of the head over the symphysis pubis would be more apparent than real. It was to be noted that the thumb, by which the amount of overlapping at the symphysis pubis was estimated, was the principal part of Kerr's method, and differentiated it entirely from the methods of Müller and Pinard. The thumb should be laid flat on the outside of the symphysis and flush with its upper border. A full bladder and a pendulous abdomen, especially in primiparae, made the estimation of overlapping difficult. A loaded rectum, tumours, or a placenta lying behind the foetal head pushed the head forwards so that the overlapping was exaggerated. Occipito-posterior cases in generally contracted pelves overlapped more than those in which the occiput was anterior. The maximum amount of overlapping was not palpated at the centre of the symphysis but to one or other side. In flat pelves the greatest amount of overlapping was noted just immediately above the upper margin of the symphysis pubis, but in generally contracted pelves the thumb had to travel above this point to arrive at the seat of greatest disproportion. This was specially true in occipito-posterior cases.

It was as an index of treatment that Kerr's method was of such value, and Dr. Shannon detailed the procedure as carried out by him in his own wards, dividing contracted pelves, with a view to treatment, into four groups, according to the amount of overlapping of the foetal head at the symphysis pubis.

Group A.—The foetal head, on pressure, sinks into the pelvis. There is no overlapping, although the pelvis is contracted. With a patient in labour such a case is treated as normal and a spontaneous termination expected. If not in labour, she is requested to return for examination at a later date.

Group B.—This comprises cases in which overlapping is of minor degree. The head does not enter the brim. It "bites." Measured by the thumb, the overlapping is not flush with the outside edge of the symphysis pubis. If those cases are in labour, they should be left to Nature. The forces of labour will obliterate the disproportion and a spontaneous birth can be expected. If not in labour, this is the best time to induce it prematurely, provided the child has reached the thirty-sixth week of intrauterine life.

Group C.—In this group there is a medium amount of overlapping. The thumb informs one that the head is flush with, and in some cases overlaps to a slight degree, the outside edge of the symphysis pubis. In those cases one hopes for a spontaneous birth. With that object in view patients are allowed to go on in the second stage for four, six, eight, or twelve hours. During this time the condition of mother and child must be carefully observed. Forceps are applied when the indications for the operation arise, and, should they fail to deliver, pubiotomy is resorted to.

Group D.—The foetal head bulges over the symphysis pubis so much that the overlapping can be seen in many cases, and often the disproportion is so great that the top of the thumb, as it lies in position, is partly covered by the part of the head that overlaps. In such circumstances one infers that no amount of moulding can diminish the diameter sufficiently to allow the head to come through the contracted brim, so one has no choice but to perform Caesarean section, if the child is alive, and craniotomy, if the child be dead.

Dr. Shannon referred to the difficulty of treatment in these cases, and laid stress on the fact that, before treatment could be efficiently indicated by Kerr's method, the following factors had to be carefully determined and their relationship one to the other accurately considered as far as was possible:

1. Pelvic measurements, to determine type of pelvis.
2. Consistence of foetal head.
3. The variety of biparietal obliquity.
4. The position of foetal head in pelvis.
5. The expulsive forces of labour.

Dr. J. W. BALLANTYNE thought Dr. Shannon's paper might be termed the scientific specialization of Barbour's dictum that the foetal head was the best pelvimeter. Dr. Shannon had said nothing about the cephalometer, and he concluded that Dr. Shannon's experience agreed with his own, that the results were fallacious.

Dr. LACKIE agreed that the usual estimation of the size of the pelvis from measurement was unsatisfactory in affording a guide to treatment in many cases, especially in the medium variety of contractions.

Dr. HAIG FERGUSON pointed out that the early descent of the head into the pelvis, which commonly occurred in a primipara before labour, explained why a second labour, in which the head had developed till full time above the brim, might be attended with greater difficulty.

Double Congenital Hydronephrosis.

Drs. R. W. JOHNSTONE and F. J. BROWNE afterwards read a paper on a case of double congenital hydronephrosis. The child, a female infant weighing 6½ lb., appeared normal, but died without any apparent cause six hours after birth.

At the *post-mortem* examination the histological appearances of lung and liver suggested syphilis, but the father's Wassermann reaction was negative, and sections of the foetal organs

stained by Levaditi failed to show spirochaetes. The right side of the abdomen was occupied by a cyst the size of a cricket ball and connected with the right kidney. The left kidney seemed normal, but only about half the usual size. Microscopically the kidney showed a marked increase of the interstitial connective tissue with few tubules, those that were left being dilated, in some cases to form small cysts. The right ureter was thickened by new fibrous tissue, the muscle being diminished in amount. The left ureter was completely obliterated during part of its course by fibrous tissue.

The condition seemed to be primary in the ureters, and due to a chronic inflammatory change involving chiefly the muscular coat, and causing stenosis and obliteration of the lumen with secondary changes in the kidneys.

AT a general meeting of the Camberwell Division of the British Medical Association, held on January 5th, at the Camberwell Infirmary, with Dr. A. F. HEALD in the chair, in the course of an address on "One or two points of medical utility," Dr. HERBERT FRENCH stated that in cases of so-called primary acute nephritis some focus of infection could generally be found somewhere in the body, and expressed the opinion that in many cases the tonsils were at fault; he quoted interesting cases in support of his theory. Dr. LLOYD referred to the occurrence of albuminuria in many cases of impetigo in children, and other speakers drew attention to pyorrhoea, and especially scarlet fever, as similar causes of nephritis. Dr. FRENCH also spoke of the good effect simple puncture had in many cases of delayed resolution in pneumonia, even in cases in which no fluid was obtained, but could offer no explanation of this phenomenon. Lastly, he referred to the good effect that could often be obtained by the administration of small doses of thyroid extract in the periodic sick headaches of women.

A PATHOLOGICAL MEETING of the West London Medico-Chirurgical Society was held on January 7th at the West London Hospital, with Dr. F. J. MCCANN, the President, in the chair. A series of interesting pathological specimens was shown by Mr. W. MCADAM ECCLES, Dr. W. H. WILLCOX, and other members.

Reviews.

THE PREVENTION OF VENEREAL DISEASE.

THE book, *Prevention of Venereal Disease*,[1] by Sir ARCHDALL REID, is addressed, on the one hand, to those who would prevent venereal disease in themselves, and on the other, to those who would prevent it in the community; it is endorsed by the Society for the Prevention of Venereal Disease, and contains the evidence and arguments on which that Society bases its policy. It has a preface by the author, and an introductory chapter by Sir Bryan Donkin.

That part of the book which deals with the means for preventing venereal disease by means of prompt disinfection is built on the foundation of some extraordinarily good results obtained by the author during the war amongst soldiers in the Portsmouth area and by Surgeon Commander Boyden amongst sailors at Whale Island. The figures as given are as follows:

Sir A. Reid: Average number of troops 2,000. Rate per 1,000 per annum, 1.5. Six cases of gonorrhoea and one of syphilis. Of these men, two infected by their wives, two (drunk) took no precautions, one only just arrived in camp not instructed and took no precautions, and two did not use disinfectant till more than one hour after risk run.

Surgeon Commander Boyden: 496 men used disinfectants. One case of syphilis: he used it six hours after exposure.

These figures will be accepted by anyone who has any knowledge of the subject. There is only one weak spot in them, and that is that he was dealing with a very shifting and migratory population. It is not possible for him to say how many men may have become infected before leaving his medical charge in whom the disease developed elsewhere, but for practical purposes this objection may be regarded as negligible.

That part of the book which deals with Sir Archdall Reid's method of early disinfection might well have been compressed into a couple of pages, because, boiled down, it simply means that every person should have the knowledge that infection can be prevented by the immediate use of 1 in 1,000 solution of potassium permanganate, which, with a swab of cotton-wool for application, should always be carried on the person in a properly shaped and corked bottle for use as required.

But there is a good deal more than this in the book. The urgency of the problem is insisted upon, and here certain exaggerations, which are doubtless to be attributed to the enthusiasm of the writer, become at once apparent. He states, for example, that the prime cause of the German success in the spring of 1918 was the large number of British and Allied soldiers incapacitated in venereal disease hospitals! He states that almost every other person in the United Kingdom has, at some time or other, been infected with venereal disease, and that there are few, if any, families of which some members have not been infected. It is certain that numbers of practitioners with a great experience of practice, spread over many years, will demur to this. The problem is urgent enough, and there is no need to accentuate its gravity by even the slightest exaggeration.

A great part of the book consists of an interesting and well written dissertation on instinct and reason, inclination and morality, and a chapter on microbic diseases written so that it can be easily "understanded of the people." The remainder of the work contains various statistics of disease in the overseas troops, with some pages on the findings of the Interdepartmental Committee and a verbatim report of the debate in the House of Lords on the motion for papers by Lord Willoughby de Broke. A great part of this section consists of controversial and polemical matter. Sir Archdall Reid has two King Charles's heads, the one "The Royal Commission on Venereal Disease," the other "The National Council for Combating Venereal Diseases." His condemnation of the Royal Commission, its composition and its report, and his imputation of unworthy motives on the part of its members which led to the issue of the report in the form in which it appeared, are exceedingly strong and intemperate. His particular objection is that the Commission took no evidence on Metchnikoff's discovery that the prompt use of calomel ointment after inoculation with syphilis in the case of apes prevented the development of the disease, and in its report ignored it. By not taking this evidence he states that the Commission betrayed its honour, did not play the game, and committed the offence which Englishmen hold unpardonable. The infection of soldiers, innocent women and children, and men, who were being poisoned by the many millions, was thrown into the scales, and against all this and against their own personal honour "the little members of this miserable little Commission put their most miserable little prejudices and found their prejudices the heavier." I have it from members of the Commission that no one ever suggested bringing the question of Metchnikoff's discovery before it. I am assured that had there been such a suggestion fullest inquiry would have been made and evidence courted. Sir A. Reid states that some of the medical members consulted whether they should introduce this subject, but abandoned the idea fearing prejudice and opposition. Therefore, the whole of the blame which he imputes to the Commission must rest on the heads of those medical members of it who, after consultation, decided not to bring a matter of such importance before it, and not on the unfortunate lay, clerical and female members, who, at that time, 1913–14, had probably never even heard the name of Metchnikoff or read of his discoveries. Such imputations on persons of the character of those who formed the Royal Commission are quite unjustifiable.

His second *bête noire* is the National Council for Combating Venereal Diseases. Because it does not see eye to eye with him it can do nothing right, yet he expends many pages in laying stress on the necessity for enlightenment of the public and the education of the very young in chastity and self-restraint, thus creating a "bias" in this direction, apparently quite oblivious, or ignorant, of the fact that this is the main plank in the platform of the Council, and has been preached both at public meetings and in private whenever possible on hundreds of occasions during the last five years. He states that ablution rooms were instituted by the Army Council despite the opposition of the National Council. As a matter of fact that body, through one of its Vice-Presidents, Sir Thomas Barlow,

[1] *Prevention of Venereal Disease.* By Sir G. Archdall Reid, K.B.E., M.B., C.M., F.R.S.E. London: W. Heinemann (Medical Books), Ltd. 1920. (Cr. 8vo., pp. 465. 15s. net.)

urged and helped in every possible way the establishment of these rooms throughout the army. Sir Archdall Reid considers that it possesses all the faults usual to scientific societies and teaching bodies which are under ecclesiastical control. As a matter of fact, on its medical and executive committees there are about thirty-eight medical members, one bishop, and one other minister of religion—the Rev. J. Scott-Lidgett.

Sir Archdall Reid has not much belief in the efficacy of lectures in preventing the men running the risk of infection. He does not seem to have heard any lectures, and the one reported to him by his orderly (if the report be correct) was well calculated to make the judicious grieve. He states that, as far as he knows, no impression was made and the men looked on it as part of their ordinary work. The results of one lecture given to 3,000 young troops, as testified by the medical officer in charge, were even better than those obtained by Sir A. Reid by disinfection. Before that lecture the incidence of venereal disease was about the usual in that unit; after it, during three months in a country district, and five months later on in an East Coast town, swarming with temptations, there was only one case of venereal disease and that was caught three days before the lecture. Figures very nearly approaching this good result have been given to the reviewer by commanding and medical officers of the various dépôts where lectures were given at frequent intervals during the war. Their testimony is that the result of a lecture was that the men who were sick came for treatment, and afterwards, while that unit remained at the dépôt, the number of cases of venereal disease diminished from 50, 40, 30, as the case might be, to 3, 2, 1, or none.

But it is barren work to revive past controversies with regard to the forces. The army has melted into the civil population, and doubtless some of the 40,000 men who came under Sir A. Reid's instruction will remember and carry out his methods in civil life; doubtless a certain number of the 500,000 men (slightly less or more) to whom I have lectured will retain the impression which these lectures (*malgré* Sir Archdall Reid) made on them, but the problem at the present time is that of the civil population as a whole, not that portion which constituted the naval and military forces during the war.

The policy of the Society for the Prevention of Venereal Disease is, shortly, that all persons should be instructed in the fact that disinfection at the earliest possible moment after a risk has been incurred will almost certainly ensure immunity from infection. This means, since the first risk taken may be as fatal with regard to contracting disease as the fiftieth, that young persons should be instructed as early in life as may be possible. As most of the risks run are the result of an unpremeditated impulse or temptation they must learn that it is essential that the materials for such disinfection should be carried about continually on the person ready for use. Miss Ettie Rout, a member of the Grand Committee of the Society for the Prevention of Venereal Disease, crystallizes the policy of that society in the following words, quoted by the Archbishop of Canterbury in the debate in the House of Lords: "Every boy and girl in our parishes must be provided free with the outfit which will make them secure, and when you have done that all will be right—go with clean people and you will be clean."

The success obtained by Sir Archdall Reid was due to the fact that he is an extremely able, enthusiastic and energetic man. In the book he describes how he gave instructions personally to every man on joining his unit—if only one man paraded as a new-comer, that one man was individually addressed and instructed. In all cases where the method of rapid disinfection failed, the failure is attributed to the fact that the troops—Overseas or British—were not properly and thoroughly instructed. To deal with the civil population of more than 40 millions not under discipline in this manner is impossible. To ensure that each individual is thoroughly and personally instructed in the methods of disinfection by a medical practitioner as competent, skilled and energetic as Sir Archdall Reid is not practicable. To expect that young men, and young women also, will learn the technique of disinfection from leaflets, posters displayed in a public place, or printed instructions in a "packet," and proceed to carry it out satisfactorily is absurd. The result could only be to multiply enormously the number of risks which would be taken by persons who would imagine that if disinfected they were absolutely safeguarded. To carry about a bottle and swab of cotton-wool in the pocket would be a continuous suggestion and incentive to their use; and, as in many cases they would not be used properly, there would be a very much larger number of cases of failure than would occur if each individual were properly instructed by an expert. In addition, it must be remembered that the average individual would be apt to imagine that that which may prevent can certainly cure, and would use a disinfectant to treat the disease when developed—a result which would be disastrous to the individual and to the community.

Instruction is the keynote of the whole of the book, and it is pointed out that unless the instruction be efficient the results must be bad. Doubtless this book will have its uses—it will fortify with knowledge that man who, in a cold-blooded fashion, gratifies his passions; it will confirm him in the pursuit of his hobby, and in many cases will prevent the infection which might follow.

Should it be extensively read among the populace it will, in my opinion, give the first push on the downward road of promiscuous sexual indulgence to numberless boys and girls. Boys, because they will take it that such a publication gives official, or semi-official, sanction to loose conduct, and therefore, under the shield of disinfection, will take the line of least resistance. Girls, because in their case, in addition to the promptings of passion, there will be added the allurements of probable "contraception" and possible disinfection. Of these thousands many, no doubt, will be protected, but in a large number of cases prevention will fail. Many a pitcher, rendered bold by immunity, will go too often to the well. A soldier in Cologne said to the reviewer: "I swabbed it off six times and thought I had the seventh, but I have just come out of 25 General." The probabilities are, therefore, that under such teaching the gross number of cases of disease will be increased though the percentage rate may be diminished. A warning that an indiscretion may be followed by disease will most certainly diminish the number of risks taken.

It is a pity that, in a controversial work of this sort, the author should be intemperate in his language and ready to impute unworthy motives to those who are just as anxious to diminish the incidence of this disease as he is.

E. B. TURNER.

PSYCHOLOGY OF THE SPECIAL SENSES.

IN the introduction to the reprint of his Croonian lectures on the Psychology of the Special Senses[2] Dr. HURST says that his views on hysteria differ from those held by the majority of neurologists, but we cannot find that he gives an explicit account of what his views really are. We are disposed to infer, however, that they do not differ in any marked degree from those of Babinski, and that Dr. Hurst is in agreement with the majority of neurologists of experience. Like Babinski, he gives no answer to the fundamental question as to why among the many exposed to almost identical experiences in war and peace only a small minority should develop symptoms of hysteria. It is the answer to this question that we seek in vain equally among the writings of those who support the analytic method of investigation and those who, like Dr. Hurst, approach the problem of hysteria from an objective standpoint.

In conjunction with Mr. Gainsborough, the author studied the manifestations spontaneously presented by a number of healthy students, ignorant of medicine, who were instructed to pretend that they were suffering from paralysis due to an accident. The distribution of the mimic anaesthesia in these cases lends support to Babinski's dictum that between hysteria and fraud there is only a moral difference. So much is obvious, but it is not so clear why an absolute anaesthesia should never be found in the malingerer which will enable him to bear, without flinching, a severe painful stimulus, whilst such absolute anaesthesia is not uncommon in hysteria. Few clinical observers will, we fancy, endorse the experience of Dr. Hurst when he says he has never been able to find any evidence of cutaneous hyperaesthesia in "Head's areas" in cases of gastric or duodenal ulcer when he has guarded against suggestion. Emphasis is laid on the absence of

[2] *The Psychology of the Special Senses.* By A. F. Hurst, M.A., M.D. Oxon., F.R.C.P. London: H. Frowde, and Hodder and Stoughton. 1920. (Demy 8vo, pp. 133; 29 figures. 12s. 6d. net.)

pharyngeal anesthesia as a stigma of hysteria, and it may be recalled that Iwanoff, in 1910, by observations on a large number of cases of hysteria, definitely disproved its existence.

A large section of the book is devoted to the subject of hysterical deafness. Here the author states that "the only test upon which complete reliance can be placed in the diagnosis of absolute hysterical deafness from absolute organic deafness is the presence of normal vestibular reactions in the former and their absence in the latter." But James, in 1882, found signs of vestibular reaction in 45 per cent. of deaf-mutes; Kreidl and, later, Golla found that about 50 per cent. of deaf-mutes gave a vestibular reaction; and Mygind found an intact labyrinth in 50 per cent. of his *post-mortem* examinations of deaf-mutes. The suppression in hysterical deafness of the "jump," or auditory-motor reflex, the site of which has been shown by Sherrington to lie in the mid-brain, is evidence of an active cortical inhibition that is suggestive of much in the pathology of hysteria rather than of "unswitching of the synapses at the level of the reflex or still lower."

It is clear that we are still a long way from any general agreement as to the nature of hysteria.

OPERATIVE GYNAECOLOGY.

ONE of the most interesting features of the second edition of Dr. CROSSEN'S *Operative Gynaecology*[3] is his classification of the more important operations that have been devised for the treatment of prolapsus uteri. Not that he discusses or even mentions them *all*, but he classifies some hundred and ten of the more important modifications! This piece of work will be of value in enabling the less experienced operator, as the author hopes, to select the best operation in each individual case, and not to cleave to any one operation as if it could possibly be the best procedure in every case. The living pathology of prolapse differs so much in different cases that the prevalent tendency to do one operation, and one operation only, in the treatment of the condition cannot possibly lead to the best results.

The ordinary major and minor operations are well described, and many points, small but important, are brought out—points too apt to be overlooked in the pressure of routine work. The section on radical abdominal hysterectomy for cancer of the cervix is particularly full, and is illustrated in detail most helpfully, both as regards the various steps of the operation itself and the ureteral and other complications that may be encountered.

Dr. Crossen's book will be useful to gynaecologists and to surgeons embarking upon pelvic work. Its illustrations are very numerous and for the most part very helpful. There is, however, a lack of balance in the work, and it is extravagant to devote four pages to and to illustrate fully the operative treatment of such an exceedingly rare condition as syphilitic destruction of the urethra. Also it seems unwise and pathologically unsound, in the present state of our knowledge of it, to describe as a separate entity such a condition as acute pelvic oedema, of which only some five cases have been described. The author's textbook of gynaecology would be a more suitable place for the latter than an operative textbook. Apart from these slight weaknesses, however, it is a useful work, and both the author and the publishers are to be congratulated on a highly creditable volume.

PUBLIC HEALTH AND INSURANCE.

THE publication in book form of a number of *Addresses on Public Health and Insurance*,[4] given by Sir ARTHUR NEWSHOLME in America, will be welcomed as giving the experience and opinions of one who was for eleven years the Chief Medical Officer of the Local Government Board. A considerable part of the addresses consists of a historical survey of the activities of the public health authorities of Great Britain, for which some remarkable successes are claimed. We are told, for example, that "between 1871–80 and 1910–12 in England the average expectation of life at birth for males increased from 41.4 to 51.5 years and for females from 44.6 to 55.4, an increase within three or four decades of ten or eleven years in the average duration of life," which is equivalent to "an annual saving of 234,955 lives." Quite justifiably it is claimed that a large proportion of this improvement is due to the preventive measures carried out by public health authorities.

Sir Arthur Newsholme complains that the work of the health authorities has been hindered by the rigid boundaries within which their activities have been confined. "It was one of the misfortunes," he says, "associated with the deterrent policy of Poor Law administration in medical relief that separation between Poor Law and public health appeared to offer the best prospect of sanitary progress." The Report of the Poor Law Commission in 1909 fully recognized this fundamental mistake, and Sir Arthur repeatedly expresses his regret that action on the lines of the report was not taken. He thinks that "it would not have been an insuperable task to find a common measure of agreement between the majority and minority reports"; he contends that if the duties of Poor Law authorities had been transferred to the councils of counties and county boroughs, these authorities would have had a medical service of some 4,000 doctors with large infirmaries, and England would by this time have built up a national medical service freed from Poor Law shackles, and with a range easily capable of extension as needed. The national insurance system was adopted instead, and this he regards as a great calamity, which has delayed public health reform. In entering into this area of controversy it may be doubted if he does himself justice. He claims, but by no means proves, that the creation of the Insurance Committees, instead of handing over all medical functions to the public health authorities, was "one of the greatest blunders of the National Insurance Act." If the public health authorities and the Local Government Board itself had been far more perfect than they were, even in their limited domain, there might have been some ground for the claim, but it was not without the soundest reasons that on several occasions deputations from the British Medical Association strongly opposed the handing over of the medical functions to the Local Government Board. For many years the British Medical Association had agitated for a radical reform of the Local Government Board, but seemed powerless against bureaucratic influences; it was a blow to the bureaucracy of the Local Government Board when the National Insurance Act introduced for domiciliary treatment the totally separate *ad hoc* Insurance Committees.

It is somewhat surprising to find the author repeatedly saying that "the money in maternity benefit is given unconditionally" (pp. 95 and 111), for the Insurance Acts distinctly provide that maternity benefit "shall be administered in the interests of the mother and child in cash *or otherwise*"; the money gift is not unconditional. The model rules of approved societies make it clear that a mother must be attended at her confinement by either a doctor or a certified midwife, and a husband receiving maternity benefit is bound under penalty of imprisonment to make adequate provision to the best of his power for the maintenance and care of his wife during her confinement and for four weeks after her delivery. In addition to this, in numerous cases the societies have entered into agreements with suitable hospitals for in-patient treatment when required, thus administering part of the benefit "otherwise than in cash." Mistakes of this sort seriously detract from the value of the book. Nor does the author gain anything by belittling the work of the panel doctors, who have treated not only serious and chronic cases of disease best suited for home treatment, which no hospital would accept, but also enormous numbers of cases of incipient diseases where simple remedies and a few words of advice must often have prevented serious consequences. It is true, as the author says, that the national insurance scheme is restricted both as to the persons eligible and the range of treatment; Mr. Lloyd George claimed that the insurance scheme was a business proposition intended primarily for those who either could not or would not make provision against illness, and who could not or would not even pay their doctors' bills. As a business proposition the benefits and the range of medical services provided were strictly limited by the subscriptions, helped by a parliamentary subsidy from the State, and as a business proposition the insurance was able to weather the storm of the Great War when the local health authorities were almost stranded.

[3] *Operative Gynaecology*. By Harry Sturgeon Crossen, M.D., F.A.C.S. Second edition. London: Henry Kimpton. 1920. (Roy. 8vo, pp. 744; 834 figures. 63s. net.)

[4] *Public Health and Insurance: American Addresses*. By Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Baltimore: The Johns Hopkins Press. 1920. (Cr. 8vo. pp. 284. 2.50 dols.)

So far as the addresses are merely historical they are interesting and useful, and so far, too, as they deal with suggestions for the administration of public health services they deserve the consideration due to the views of an expert in public health work. But so far as they deal with criticism of national insurance they need to be received with caution.

ANAESTHESIA IN DENTAL SURGERY.

FIFTEEN years ago, as the authors remind us in their preface, there were publishers who said "no field" to their book on *Anaesthesia in Dental Surgery*.[5] The dental profession, however, gave a more favourable verdict, and, in spite of competitors, Messrs. LUKE and Ross found themselves called upon, over a year ago, to revise, enlarge, and edit a fourth edition. We must apologize for an accidental delay in noticing it. A chapter on ether and chloroform has been added in the new edition, and is well up to the standard of this deservedly popular book.

The authors' advocacy of ethyl chloride, and their description of the nitrous oxide, oxygen, and ethyl chloride sequence will do much to popularize the use of this drug, but we trust the same will not hold good in the case of the method of "multiple puncture," which is the only way of using local anaesthetics referred to in the chapter dealing with local anaesthesia. This chapter, indeed, needs rewriting, and "regional anaesthesia" should replace "multiple puncture."

Discussing prolonged "gas" administration, the authors seem to endorse the claim that there is a stage of analgesia before loss of consciousness, in which analgesic stage painful dentine can be drilled and live pulps extirpated without pain. Many have never found this stage, and would be grateful if the authors would more clearly define the method of its production. Our opinion of the book remains as before—an excellent work, and well worthy of careful reading.

NOTES ON BOOKS.

THE sixth edition of *Wheeler's Handbook of Medicine*,[6] edited by Dr. JACK, follows the fifth edition at an interval of four years, and its reprint dated 1918. It has been carefully brought up to date, augmented, and rearranged, and the editor is to be congratulated upon the large amount of information he has succeeded in compressing into this small and handy volume. Considered as literature it makes rather breathless reading, perhaps; but it is a book beloved of medical students for its precision and dogma, and it may be said to exhibit the merits that make for success.

The fifth edition of Dr. AITCHISON'S *Medical Handbook*[7] is designed to provide the general practitioner and the medical student with a *vade mecum* written on clinical lines. The diseases affecting the various systems of the body are considered in successive chapters, and there are special accounts of *post-mortem* examinations, prescribing, and various clinical tests at the end of the volume. Pathology and treatment receive adequate consideration throughout its pages. Dr. Aitchison writes from a soundly conservative point of view, and his little book, which contains a large amount of useful information, should be of service to many practitioners of medicine.

The addresses delivered at the Cardiff meeting of the British Association have been published in a volume with the title *The Advancement of Science, 1920*.[8] The volume opens with the presidential address by Professor Herdman, and this is followed by those given in the various sections.

The *Hazell Annual*[9] for 1921 has all the characteristics of this well arranged yearbook. It contains a great amount of condensed general information, and forms a useful work of reference. The present edition retains the text of the Covenant of the League of Nations, and gives a short history of the position of the League up to date. An exhaustive account of the casualties and losses in the great war is found at the end of the volume; and tables are included of the post-war strength of the navies of the great powers. The sections devoted to Government departments, the colonies, and education are particularly full. This year the invidious task of trying to give within a few pages an adequate retrospect of medical progress during the past twelve months has been abandoned.

[5] *Anaesthesia in Dental Surgery.* By Thomas D. Luke, M.D., F.R.C.S.Edin., and J. Stuart Ross, M.B., F.R.C.S.Edin. Fourth edition. London: William Heinemann (Medical Books), Ltd. 1919. (Cr. 8vo, pp. 255; 22 figures. 8s. 6d. net.)

[6] *Wheeler's Handbook of Medicine.* By William R. Jack, B.Sc., M.D., F.R.F.P.S.G. Sixth edition. Edinburgh: E. and S. Livingstone. 1920. (Cr. 8vo, pp. xv + 561. 12s. net.)

[7] *A Medical Handbook: For the Use of Practitioners and Students.* By R. S. Aitchison, M.D., F.R.C.P.E. Fifth edition, thoroughly revised. London: Charles Griffin and Co., Ltd. 1920. (Fcap. 8vo, pp. xvi + 390; 41 figures. 10s. 6d. net.)

[8] London: John Murray. (6s.)

[9] *The New Hazell Annual and Almanack for the Year 1921.* Edited by T. A. Ingram, M.A., LL.D. Thirty-sixth year of issue. London: H. Frowde, and Hodder and Stoughton. 1921. (Cr. 8vo. pp. 832. 7s. 6d. net.)

APPLIANCES AND PREPARATIONS.

An Improved Knee-cap.

MR. E. MUIRHEAD LITTLE (London, W.) writes: A perfectly fitting knee-cap—that is, one which closely embraces the joint in all positions of flexion, as well as in full extension—is probably unattainable, but it has seemed to me that it might be possible to improve upon the types usually supplied. Most knee-caps, if adjustable at all, are made so by the use of eyelets and laces. When these laces are tightened they draw the upper and lower borders of the knee-cap towards one another and thus favour the already existing tendency of the appliance to wrinkle transversely. Moreover, when the lace is tightened the knee-cap is tightened throughout its length, and more than one lace is required if it is desired to tighten one part more than another. Some years ago, on the suggestion of a patient, I substituted straps and buckles for the eyelets and laces of the ordinary knee-cap and found them a great improvement; afterward, the knee-cap, which is shown in the annexed figure, was evolved. I have been in the habit of prescribing this kind of knee-cap for some years, and my patients have found that it is more comfortable and gives much better support than the ordinary laced or not-adjustable knee-cap. The following is a detailed description:

The knee-cap illustrated herewith is made in high grade stout drill and best quality elastic web, so fitted in strands overlapping one another as to prevent any bulging when the knee is bent, which would happen if the elastic were in one piece. A soft pad is placed over the front of the patella as an extra protection, while the back of the knee is cut out to allow free flexion. The adjustment is made by the webbing straps; this allows of more or less pressure being applied at any particular point that may be necessary, which is impossible with lacing. The whole appliance is made upon specially constructed models in order to ensure a perfect fit. It has been made for me by Mr. Albert Edward Evans of 38, Fitzroy Street, W.1, who has most successfully carried out and improved upon my suggestions.

THE TEACHING OF RADIOLOGY AND ELECTROLOGY.

WHEN Röntgen first called attention to the fact that *x* rays had the power of penetrating substances hitherto believed to be opaque to all forms of light, and of impressing upon a photographic plate shadows of such substances according to their density, the medical profession was prompt to apply this wonderful property of *x* rays to diagnostic uses. The war impressed the public with the value of *x* rays in diagnosing injuries to bones and in localizing projectiles, but the public at large, and even the medical profession itself, scarcely realize how far radiology has already progressed, how wide is its literature—journals in England, the United States, France, Germany, Austria, Italy and Spain being specially devoted to it—and how it has become a branch of medicine needing not only a special training and experience, but claiming a whole-time devotion on the part of those who take it up.

The apparatus used has become increasingly complicated, and the technique more exacting, and, even were its present applications only those mentioned above, the interpretation

of shadows, though easy enough in many cases, is exceedingly difficult and sometimes misleading in others, for even the skilled worker makes oversights and errors in diagnosis. But the diagnosis of diseases of the alimentary tract by means of a meal opaque to *x* rays has opened a new field of research, which has already yielded results of great value, and calls for still more skill and experience in interpretation. Another promising field of usefulness is the therapeutic effect of *x* rays, properly administered, upon superficial skin lesions and upon deep structures like myomata of the uterus. In malignant disease, also, *x* rays have been shown to have a profoundly modifying effect, in most cases retarding and in a limited number definitely curative.

Electrology has become a sister subject, claiming also the whole-time devotion of certain of its specialists. It includes the use of various forms of electrical currents—faradic, galvanic, sinusoidal, static—the use of high-frequency currents, and their most recent and powerful developments known as diathermy, especially the surgical uses of this last in cauterizing, either superficially or deep in their substance, the affected tissues.

The Cambridge Diploma.

It is manifest that special training is needed by those who practise this art, and it follows that practice should be restricted to those who can show proof of such training. The first body to take the necessary step was the University of Cambridge, which established, in 1919, a Diploma in Medical Radiology and Electrology, to which we called attention a year ago.[1] The University Committee for the Diploma works in close association with the British Association for the Advancement of Radiology and Physiotherapy, which was the original moving spirit in the matter, and at present courses of instruction are given alternately in Cambridge, arranged by the University, and in London, arranged by the above-named Association, the latter course being recognized by the University as qualifying for the examinations.

Courses of Instruction.

The first course was held in London during the early half of 1920, and there were 22 candidates at the June examination, instruction in physics being given at University College, whilst the teaching in radiology and electrology was given at the Royal Society of Medicine under the aegis of the Fellowship of Medicine, by the combined heads of the radiological and electrological departments of the leading London and other hospitals, with clinical work in the individual hospitals. The second course was held in the latter half of 1920 in Cambridge, the physics being done at the Cavendish Laboratory, and the University Lecturer in Medical Radiology and Electrology receiving most valuable assistance by lectures in Cambridge from many of those who had helped in the first London course. There were 15 candidates at the Christmas examination. A new course—somewhat modified as experience suggested—has just begun in London, the physics being, however, now done at King's College and at the Middlesex Hospital. A further course will begin at Cambridge next June.

The courses extend over six months; they include a special training in physics and electro-technics on the one hand, and in radiology (including the use of radium) and electrology on the other. The lectures in London extend over the whole six months; in Cambridge they are compressed into the Long Vacation and the Michaelmas Term, and arrangements are made for those taking the course there to gain additional experience between the courses of lectures by receiving clinical instruction in various London hospitals.

Further information as to the Diploma and as to the instruction in Cambridge can be obtained from Dr. Shillington Scales, Medical Schools, Cambridge; and as to the London course from Dr. Stanley Melville, at the office of the British Association for the Advancement of Radiology and Physio-therapy, 11, Chandos Street, Cavendish Square, London, W.1.

Lines of Advance.

There is another aspect which should not be lost sight of. The British Association for the Advancement of Radiology and Physio-therapy, as has already been said, was instrumental in getting the University of Cambridge to establish the diploma; it has organized the teaching in London, and its members have given generous assistance to the teaching in Cambridge. Further, it is arranging this year an International Congress in England. The primary object has been to advance the study of its subjects, and incidentally to raise the position of those practising them, so that the radiologist and electrologist may obtain due recognition and status among their colleagues on hospital staffs. There are now few large hospitals in which this recognition has not been afforded. But above all, the association has shown the workers in these subjects the value of combined effort rather than of isolated individualistic work. If progress is maintained along such lines, or along modifications of such lines, we may see built up a British school of radiology and electrology which should attract workers from far and near, who, instead of attending the clinic of a single teacher, may obtain in their six months' course of tuition for the diploma both a special training and a knowledge of the special work of the leading English radiologists and electrologists. Funds are urgently needed to establish a small institute where research work can be undertaken.

[1] BRITISH MEDICAL JOURNAL, January 10th, 1920, p. 55.

THE OSLER MEMORIAL.

WE announced some months ago that a representative committee had been formed for the purpose of raising a fund to provide a memorial to the late Sir William Osler. It was considered that the most appropriate form of memorial would be an Osler Institute of General Pathology and Preventive Medicine in Oxford. Osler began his life with his chief interests directed towards pathology, and he ended it with an enthusiastic belief in the future of preventive medicine. A large general committee was formed, and a smaller executive committee, of which the Bishop of Ripon—then Dean of Christ Church, Osler's college—was the chairman, and Dr. J. A. Gunn, professor of pharmacology in the university, the honorary secretary. The proposed form of memorial was approved at a public meeting held in Oxford on March 6th, 1920, and has met with general approval.

A preliminary list is given below of subscriptions which have already been received from members of the medical profession towards the fund which is being raised for a memorial to the late Sir William Osler. It is hoped that there may be others, whose attention has not been drawn to the memorial, who may wish to contribute. The fund now amounts to about £1,800.

Subscriptions may be sent to the Osler Memorial Fund, National Provincial and Union Bank of England, 91, High Street, Oxford.

LIST OF MEDICAL SUBSCRIBERS.

£100.—Professor T. K. Monro.

£25.—Dr. A. F. Hurst, Professor A. W. Mackintosh.

£15 15s.—Dr. Wm. Collier.

£12 12s.—Dr. P. H. Adams.

£10 10s.—Sir Clifford Allbutt, Dr. F. Buzzard, Sir A. E. Garrod, Sir R. W. Philip, Professor Arthur Thomson, Dr. Howard Bullock, Dr. Harvey Sutton.

£10.—Mr. A. P. Dodds-Parker, Dr. A. G. Gibson, Sir Wilmot Herringham, Dr. J. A. Ormerod.

£5 5s.—Professor Adami, Dr. H. Barnes, Dr. Duigan, Dr. R. Hutchison, Dr. E. Hobhouse, Dr. Percy Kidd, Dr. Geo. Mackay, Dr. E. S. Reynolds, Sir Seymour Sharkey, Dr. H. S. Souttar, Professor C. S. Sherrington, Dr. Ainley Walker, Dr. A. T. Waterhouse.

£5.—Sir F. H. Champneys, Sir Walter Fletcher, Sir Alfred Keogh, Professor Harvey Littlejohn, Sir F. W. Mott, Sir Donald MacAlister, Professor G. A. Murray.

£4 4s.—Dr. R. O. Moon.

£3 3s.—Professor Finlay, Professor Gunn, Dr. Dunbar Hooper, Dr. J. H. Morgan, Sir H. D. Rolleston, Dr. J. F. Robinson.

£2 2s.—Dr. E. Bramwell, Dr. W. H. Fearis, Dr. J. Griffiths, Professor Halliburton, Sir A. Newsholme, Dr. F. G. Penrose, Dr. Raymond Crawfurd, Sir Felix Semon, Dr. Cecil Wall.

£1 1s.—Dr. F. H. Dickson, Professor F. H. Edgeworth, Sir John Goodwin, Dr. J. B. Hurry, Dr. Hinds Howell, Professor A. J. Hall, Dr. Clive Rivière, Dr. A. Whitfield.

M. LAVERAN, a physician and pathologist whose discovery of the malarial parasite has made his name so well known, is succeeded as president of the Académie de Médecine, Paris, by M. Richelot, surgeon to the Paris Hospitals. M. Bourquelot, professor of pharmacy in the School of Pharmacy of the University of Paris, has been elected vice-president, and according to the rules of the Académie will be president next year.

As the result of a report by Dr. Richard P. Strong, director of the League of the Red Cross Societies, the Spanish Red Cross has undertaken an antimalarial campaign in Spain under the direction of Professor Massimo Sella, assisted by Professor Giuseppe Pittaluga. The campaign will start in Camarca, which is the most malarial province in Spain.

British Medical Journal.

SATURDAY, JANUARY 29TH, 1921.

SHORT LIFE TABLES.

MORE than seventy years ago Dr. Farr wrote as follows: "As it might be expected, from the similarity of the human organization, that all classes of men would, *ceteris paribus*, live on an average the same number of years, it becomes important to ascertain whether this be the case; and if it be not, to determine to what extent life is shortened in unfavourable circumstances. The life table answers this purpose; and is as indispensable in sanitary inquiries as the barometer or thermometer, and other instruments in physical research." When Farr wrote those words the life table as a statistical instrument was already of a respectable age, since to John Graunt and to Edmund Halley must be assigned the credit of its invention (Graunt had the idea, but Halley constructed the first table). But the vicissitudes of the life table through the eighteenth century were not such as to commend its use to the sanitarian, since most of the tables, including the most famous of English tables, were constructed on unsound principles, and one involved the nation in heavy pecuniary loss. Hence practical men, even if unable to point out the theoretical error, were alive to the incorrectness of the conclusions drawn. So far as concerns the commercial or insurance aspects of the problem, the earlier mistakes, particularly that of Dr. Price, who constructed the Northampton table virtually from a summation of deaths without allowance for the increase of population at risk, had been recognized and corrected before the time of Farr, but to Farr belongs the whole credit of adapting the life table method to the purposes of the medical profession.

After Farr's time there was little danger of a repetition of old mistakes in this matter by instructed students, although even now one occasionally meets with inferences drawn from a comparison of mean ages at death, the means having been deduced from deaths in a non-stationary population. The employment of the life table by sanitarians did not, however, become general. The reason was that the more correct method of construction was laborious and technical. To construct a rough life table from deaths (the old method) is extremely easy; provided the deaths are given at age intervals of a year, the construction merely involves a little elementary arithmetic. Unfortunately the result in a varying population is altogether misleading. If the population is increasing, we shall have too many deaths at early ages, since the deaths at older ages occur among the survivors of a smaller population, so that the mean age at death and expectation of life will be too low. If, as in the correct method, we take into consideration the census of the living, to build up the life table does not, indeed, demand a knowledge of very recondite mathematical processes, but it does involve some facility in the manipulation of uncouth algebraical formulae and a very great amount of arithmetical labour.

Dr. Farr was, of course, aware of this difficulty and devised a short method of constructing life tables, but the approximations to the true values were not very close, and his plan did not become generally recognized. Several other short cuts have been proposed, one, discovered by Mr. George King and published in 1914 in the first part of the Supplement to the Seventy-fifth Annual Report of the Registrar-General, leaves little to be desired in point of accuracy, but is still perhaps somewhat formidable to the busy medical officer of health. The most valuable discovery, from the point of view of the medical officer of health, made in this field we owe to Dr. John Brownlee.[1] From the sanitary aspect, as Farr recognized in the quotation with which we began, the expectation of life is the "life table constant" which one chiefly desires to know. Now it should have been evident, but until pointed out by Dr. Brownlee it was not evident, that the expectation of life at any age must be some function of the population death rate at and above that age. Dr. Brownlee accordingly set to work to discover the form of the law and found it to be extremely simple. By the aid of the formulae he devised it was possible to calculate with little trouble the expectation of life at any age in a population respecting which the death rates at ages were known. Thus, to take an example, the true expectation of life of males (London, 1911–12) at age 20, as deduced by a complete method, was 42.35 years. Applying Dr. Brownlee's method to the crude data we reached, at the expense of half an hour's arithmetic, the figure 42.40. Without a mechanical calculator the time involved might have been as much as an hour.

Contemporaneously Dr. E. C. Snow was attacking the problem, and dealt with several other constants of the life table upon similar lines. The work naturally interested Sir Bernard Mallet, the Registrar-General, and Dr. T. H. C. Stevenson, whose work as Superintendent of Statistics at the General Register Office has justly earned him the highest praise to which a vital statistician can aspire—that of being a worthy successor to Dr. Farr. In the result, Dr. Snow's method was submitted to extensive tests in the General Register Office, and has now (after many years' delay occasioned by the war) been published as Part 2 of the Supplement to the Seventy-fifth Annual Report of the Registrar-General.[2]

The Blue Book contains not only a full and lucid explanation of Dr. Snow's method, with worked examples and tables which will greatly simplify the task of a computer, but also the deductions by the method of the chief life table constants for the administrative counties, the large county boroughs, and the larger rural and urban aggregates, based on the mortality experience of 1911–12. So rich a statistical feast has rarely been spread, even by the General Register Office. In discussing it, attention must of course be paid to the Registrar-General's preliminary caution: "The question how far the mortality disclosed in the years 1911 and 1912 represented the normal mortality of the district or how far it is, in fact, adversely abnormal by reason of any particular cause—for example, an epidemic—should be carefully considered." Attention must further be directed to the influence of errors of sampling upon the constants deduced from an analysis of the slender data yielded by sparsely populated areas. All these reserves being made, the contrast of different types of population is striking, if less glaring than those of the (incomparable) "mean ages at death," which daunted Chadwick. Let us, for instance, consider the expectation of life at age 20 of males computed by this method for typical areas. As instances of close aggregation and high industrialization we may take the County of London and the County Boroughs of Liverpool,

[1] *Journ. of Hygiene*, xiii, 1913, p. 178.
[2] Cmd. 1010, 1920. Price 1s. 6d. net.

Birmingham, and Sheffield. For these four great centres of industry the expectations of life of males at the age of 20 are 42.38 years, 38.48 years, 42.61 years, 41.65 years. Now let us choose four fairly populous non-industrial areas, namely, East Suffolk, Lincolnshire (Holland), Wiltshire, Oxfordshire. The figures are 47.94, 47.03, 47.07, 47.57.

It would not indeed be scientific to infer from such figures that the choice, or necessity, which determines a man to lead his life in an industrial centre rather than in the country is equivalent to an average sacrifice of from five to nine years' existence. A standard based upon other life table constants, perhaps upon the proportion of years lived between the ages of, say, 20 and 50, would be more suitable. Yet these figures are significant of much, decidedly more illuminating than those which led to the catch-word of "a C3 population." We are now within sight of a real measure of the difference in terms of health separating a rural from an industrial population.

It is a pity that no similar comparison can be instituted for the one extinct polity which, like our own, had a highly developed industrial system associated with great cities. The external features of city life in Rome are well known, and Professor Frank, of Johns Hopkins University, has recently[3] collected evidence showing that in certain industries, notably brickmaking and the manufacture of table ware, capitalist mass-production was highly developed by the end of the first century of our era. In 1913 that accomplished scholar and statistician, the late Dr. W. R. MacDonell, attempted to compute the expectation of life in different provinces of the Roman Empire, and concluded that there was an immense difference between Roman Italy and such provinces as Lusitania. Dr. MacDonell was, of course, obliged to compute his life tables from deaths only (his data were the inscriptions on tombs), so that his comparison with modern life tables may, to some extent, be vitiated by the error mentioned above. Yet the question is of high interest, since industry in the old civilizations was largely carried out by slave labour, and we wish to know how much of the contrast between town and country can be diminished by conscious effort and how much is beyond our means of control.

We are, however, straying from the path upon which we entered, and will conclude our journey with the expression of our gratitude to Dr. Snow, to Sir Bernard Mallet, and to Dr. Stevenson; the work they have carried out forms one of the most valuable contributions to vital statistics of recent years.

OPERATIONS ON TONSILS AND ADENOIDS IN OUTDOOR CLINICS.

WE have published lately a considerable number of letters upon the risks and complications of operating on tonsils and adenoids in outdoor clinics. Attention has thus been focussed upon an important subject first raised in our issue of November 1st, 1919, by Mr. Douglas Drew, and brought to a head on December 11th, 1920, by Mr. E. Watson-Williams's article, from which arose the present correspondence.

Mr. E. Watson-Williams showed that the morbidity among children operated upon in the out-patient department of the Bristol Royal Infirmary was more than four times as great as among in-patients; among 239 out-patient cases, in 1919, he had had 10 cases of morbidity (that is, of more or less serious complications), and one death, directly traced to septic infection after the operation for tonsils and adenoids; while among 100 in-patient cases in 1918–1920 (comprising those patients admitted because they did not appear robust, and a few cases in which submucous septal resection was done as well) there was only one instance of definite morbidity, and that of a much less serious kind than those recorded among the out-patients. Mr. Watson-Williams's out-patient cases, moreover, were carefully selected; no sickly child, and no child living outside Bristol itself, was included; the parents were given printed instructions for use before and after operation; the children were inspected before being sent home; the parents were directed to wrap them up well, not to allow them to walk a step, to keep them indoors for four days, and to bring them on the fifth and twelfth days afterwards for inspection; and antiseptic lozenges were prescribed. Measures on much the same lines are carried out in many other hospitals, and seem to be the best that can be done in the circumstances under which the surgeon, whose duty it is to perform such operations, has to do his work. It can hardly, however, be considered good surgical practice to leave without proper post-operative treatment, and often amidst bad surroundings, exposed to septic discharges, a raw wound of considerable size, such as is produced by this operation. Yet the choice for the surgeon at present lies between operating under such unsatisfactory conditions or not operating at all; and, on the whole, the gain to health by performing the operation is greater, taking the risks duly into consideration, than by not performing it.

In order to bring about any change there must be some unanimity in the medical profession, not only upon the best method of dealing with the children operated upon, but upon the seriousness with which the operation is to be regarded. The public and a large number of practitioners have come to look upon it as a trivial proceeding. This may partly be explained by the frequency of its performance—it is perhaps the commonest surgical operation done under general anaesthesia—and by the high degree of technical skill, the result of constant practice, displayed by throat surgeons in performing it. We are told, on the authority of Sir William Milligan and others, that some surgeons are known to perform the operation upon private patients at their consulting rooms, and to send them home by taxicab or by train a few hours later. In an operation in which, as has been pointed out by our correspondents, deaths from the anaesthetic are still too frequent, and such complications as acute otitis media, acute mastoiditis, bronchopneumonia, acute sepsis, glandular infection, and serious haemorrhage are not uncommon, this procedure would seem to be indefensible, the more so because the complications enumerated are almost unknown if the patient is kept in bed and properly nursed for two or three days after operation. The consensus of opinion among the leading authorities is that the operation should be regarded more seriously altogether, and that the patient should be admitted to hospital for at least forty-eight hours, as by that means the risk of morbidity can be almost eliminated.

The difficulty is that most hospital authorities are so circumstanced at present that they can hardly be asked to provide the necessary beds for the admission of patients after such operations, even for forty-eight hours. Nevertheless it may be pointed out that this has been done at Portsmouth Eye and Ear Hospital, and, to a modified extent, at Ancoats Hospital, Manchester. Local health authorities, on the other hand, have powers to make provision not only for the performance of this operation by payment of fees to the hospitals, as many of them do at present,

[3] *An Economic History of Rome*, Baltimore, 1920.

but also to provide suitable places for the performance of the operation and beds for post-operative convalescence. If education committees through their medical officers take the responsibility of insisting on children being operated upon—sometimes in the face of opposition from the parents—they should, we agree with Sir William Milligan, provide beds at least for those whose homes are unsuitable for safe post-operative treatment. If the beds cannot be found in the voluntary hospitals they might perhaps be provided, as Dr. P. Watson-Williams has suggested, in the Poor Law hospitals, where clinics could be established in charge of surgeons experienced in this branch of surgery, and the guardians, as in other cases, could charge the relatives of the patients for maintenance and treatment in accordance with their means.

STUDIES IN CEREBRO-SPINAL FEVER.

Of the medical problems connected with the segregation of large bodies of men in camps for military training none was more alarming or more difficult of solution than that of cerebro-spinal fever, and the fact that the disease at no time affected large numbers of the population is eloquent of the effectiveness of the measures adopted for controlling it. The mysterious sporadic outbreaks of meningitis baffled explanation, and the high mortality attending them made a scientific therapy a matter of extreme urgency. No one, however, not conversant with the state of our knowledge of the causal agent can appreciate the immense amount of pure laboratory work necessary before therapeutic measures could even be started. It was easy enough to recognize the infecting organism in the spinal fluid of those affected, but quite a different problem to ascertain its mode of conveyance and the conditions under which it spread. It cannot yet be said that we know how it penetrates the outer defences of the body. A delicate organism to grow, it necessitated much experimentation for the elaboration of some special artificial medium particularly favourable to its growth, and its differentiation from several other similar bacteria found in the nasopharynx was neither sure nor easy. The preliminary investigations on these points by Dr. Mervyn Gordon and his collaborators were fruitful in results, and the War Office is to be congratulated not only on the promptitude with which it called in expert assistance but also on its choice of the bacteriologists. A former publication of the Medical Research Council (No. 3) dealing with the earlier part of the work is now out of print, but the more recent report[1] (No. 50) issued last year embraces practically all of it, and adds the later, and perhaps more important, essays in the preparation of curative serums. The present report, covering the four years' work, is arranged under three main divisions. The first part, mainly recapitulatory, deals with the state of our bacteriological knowledge when cerebro-spinal fever first broke out amongst the troops, and gives an account of the measures taken to cope with it—points with which most people are now familiar. The second part comprises studies on the serological differentiation of meningococci from other organisms and their classification into strains, on the nature of the endotoxin, and on antibody formation. Dr. Gordon's four types of meningococci are now universally known, and for the most part, in spite of much criticism by bacteriologists on relatively minor points, his work has received confirmation and has met with the appreciation which it fully deserves. Part III of the report deals with the application of these and other studies to the prevention and treatment of cerebro-spinal fever. A striking account is given of the way in which overcrowding raises the percentage rate of carriers and how such a rise can certainly be taken as a premonitory sign of an approaching outbreak. By such careful observations the outbreak may possibly be entirely prevented, or at any rate reduced to negligible proportions. Working with the knowledge obtained from the study of the different types of meningococci, Dr. Stanley Griffith of Cambridge succeeded in producing a very potent serum against the endotoxin of Type I, though less success attended the efforts to produce antitoxin against the other types. It is difficult to obtain a standard for comparison, owing to the varying mortality of outbreaks, but, generally speaking, the use of curative serums was attended with a much diminished death rate from the disease—a diminution of nearly 50 per cent. The most obvious success was obtained with Type I antiserum: a patient with meningitis due to organisms of this type was given nearly nine chances out of ten of escaping death. This report on cerebro-spinal fever is one of the best publications of the Medical Research Council, and will long remain the standard work on the subject and the foundation on which future investigations will be conducted. Much of it, no doubt, will appeal more to the bacteriologist than to the general practitioner, but the reading of it by anyone will show the magnitude of the problems that confronted Dr. Gordon and his band of fellow-workers and the high degree of success that attended their efforts.

[1] Special Report (No. 50) of the Medical Research Council. Cerebro-spinal Fever: Studies in the Bacteriology, Preventive Control, and Specific Treatment of Cerebro-spinal Fever among the Military Forces, 915–1919.

PSYCHOTHERAPY.

To the current number of the *Edinburgh Review* Dr. William A. Brend contributes an article on psychotherapy, and the experience which has been gained in the treatment of neurotic disorders resulting from the war. He traces briefly the development of the new psychology; he indicates the nature of the difference of outlook between the various schools of thought; he explains the principles upon which psycho-analytic methods are founded; he suggests the directions in which the application of these principles would seem to be of value; and he raises a timely note of warning against the indiscriminate and unnecessary use of psycho-analysis. The tone of the article is sympathetic, and it comprises a clear and balanced survey of a difficult subject, which will be found of value to the readers for whom it is intended. In commenting upon the advances which have been made in psychotherapy during recent years, Dr. Brend makes certain constructive suggestions as to future developments. He shows that the results of treatment at the clinics for nervous pensioners have been exceedingly gratifying, and he urges the necessity for the greater provision of similar treatment for the ordinary civilian population. That there are directions in which such provision is now being made Dr. Brend shows in his references to the Maudsley Hospital, in which very useful work in investigation and teaching is being carried out under the guidance of Sir Frederick Mott, to the courses of instruction provided at some of the larger hospitals, and to the establishment during recent years at some of the universities of diplomas in pyschological medicine. In spite of these developments Dr. Brend urges that more provision is urgently necessary, and he raises a plea for the establishment, closely associated with a clinic, of a well-endowed central school for the teaching of psychotherapy. In emphasizing the need for voluntary financial help in this matter, the views of Dr. Brend are in accord with those expressed by others who are interested in the same question. Dr. E. Goodall, of Cardiff, who has taken an active part in the development of psychiatric clinics, has on more than one occasion emphasized the necessity for support from wealthy members of the community, and it is particularly interesting to note that Professor Kraepelin of Munich has recently shown that State aid does not suffice to meet the needs of the case.[1]

[1] Professor Emil Kraepelin: The German Institute of Psychiatric Research, *Journal of Nervous and Mental Diseases*, June, 1920.

In giving an account of the Psychiatric Institute at Munich, the famous German psychiatrist shows that more money is needed for a research institute on a large scale, and that the State, hampered as it is by financial difficulties, cannot be counted upon to provide this. He suggests, also, that this method of founding institutions is possibly better for their healthy growth, as it gives them greater latitude. The suggestion is of the more interest since it comes from within the Reich, where university and other educational institutes have been accustomed to rely on State aid. We would express the hope, should the rich benefactor be found, that an institute of this kind would not confine its aims to the teaching of psychotherapy, but that it would enlarge its scope to include all the manifold problems of mental disorder.

VIENNA AND LONDON.

LAST September Dr. George E. MacLean, Director of the British Division of the American University Union in Europe, addressed a letter to this JOURNAL stating that he had been informed by a young physician from one of the Middle Western States of the United States that a committee in Chicago was circularizing physicians in his State, saying that an excursion had been organized for physicians to Vienna for study, as before the war American physicians were accustomed to do. The Chicago committee gave assurances that the way had been prepared for the reception of these medical men in Vienna. We have now received a letter, dated January 15th, from Professor Wenckebach, director of the first medical university clinic in Vienna, stating that neither the Viennese medical faculty nor the official organization for post-graduate courses know anything of this propaganda. He encloses a programme of the first official course of lectures which will be given in Vienna next month; it extends over a fortnight, and is confined to internal medicine. The lectures will be given by the professors of the Vienna medical school, and each will deal with a subject to which he has given special attention; at the opening course on February 7th Professor Wenckebach will speak on cardiac insufficiency and on the value of quinine in that condition. On the same day Professor Winterberg will give a demonstration of the value of the electro-cardiograph in diagnosis. On February 8th Professor Pal will deal with arterial sclerosis; on February 9th Professor Falta with nephritis, and so on day by day until February 19th, when Professor Economo will lecture on encephalitis. The fee for the course is to Austrians, Hungarians and Poles, 200 k., to Germans, Czecho-Slovaks, Bulgarians, and Armenians 500 k., and to persons of other nations, 1,000 k. It is proposed to arrange other courses in June and December. Further particulars can be obtained from the office of the *Wiener medizinische Wochenschrift*, Wien, IX, Porzellangasse 22, when help in finding lodgings will be given. In a previous article it was stated that we were informed that the invitations issued by the American committee were accompanied by assurances of plenty of food and comfortable accommodation. On this point Professor Wenckebach tells us that, as a matter of fact, a foreigner coming with any sort of sound money will be in a position to live in Vienna quite cheaply and to get everything he wants at a price low for him. "At the same time," he states, "all the good things of life are out of reach for the Vienna people itself, because it is absolutely unable to gain enough crowns for paying such prices. The fee of a thousand crowns would mean for an Englishman something like five shillings." Professor Wenckebach goes on to suggest that it might be possible to arrange some co-operation between Vienna and London in respect of post-graduate study. The position in London, where the work of the Fellowship of Medicine and Post-Graduate Medical Association continues, is unchanged at present, but it is to be hoped and expected that the inquiries of the committee on post-graduate education just appointed by the Ministry of Health will contribute towards a satisfactory outcome.

EXPERIMENTAL INFECTION WITH LEPTOSPIRA ICTEROIDES.

IN the twelfth instalment of his researches in connexion with the etiology of yellow fever Noguchi[1] reports the results of experiments to show how *Leptospira icteroides*, the causal organism he has isolated and named, reacts to salvarsan and neo-salvarsan, both *in vitro* and in the animal body, and also to salvarsanized serum. In addition an interesting comparison is drawn between the action of these arsenical preparations and that of anti-icteroides immune serum upon *Leptospira icteroides* in experimental infections and *in vitro*. Much interest attaches to the way in which *Leptospira icteroides* is affected by salvarsan preparations, as it was found by Inada and Ido, and by Noguchi in some unpublished observations made in 1917, that infections with the closely allied *Leptospira icterohaemorrhagiae*, the exciting cause of spirochaetosis icterohaemorrhagica, are not therapeutically influenced by these drugs, and that there is thus a difference from infections with other genera of the Spirochaetoidea. Experiments now published by Noguchi show that from the therapeutic standpoint the salvarsan preparations are not of any value in experimental infection of guinea-pigs with *Leptospira icteroides*. Several series of test-tube experiments made to determine the direct effect of salvarsan and neo-salvarsan on this organism showed that these drugs exert a slow but highly poisonous influence on the leptospira, a culture of which is killed in twenty-four hours by salvarsan in dilutions of 1 in 20,000. The discrepancy between the absence of any effect *in vivo* and the destructive influence *in vitro* of salvarsan on the leptospira suggested an investigation of the action of salvarsanized serum; in serums from rabbits that received intravenously 0.05 gram of salvarsan or neo-salvarsan per kilo of body weight before bleeding, the leptospira remained active for at least an hour, but became somewhat sluggish after eighteen hours, and were all dead and degenerated in forty-eight hours, whereas leptospira mixed with normal rabbit's serum lived and multiplied. Comparison of the time (twenty-four hours) that salvarsan *in vitro* takes to kill the leptospira with the time (forty-eight hours) taken by salvarsanized serum to produce the same result shows that the action of these drugs is slower after passage through the animal than it was before. From this the important deduction follows that if this phenomenon were also to take place in the infected body injected with these drugs, it is clear that in a rapidly evolving infectious disease like yellow fever the progress of the infection will be too rapid to allow the drugs to exert their beneficial effect upon the course of the disease. In direct contrast to the behaviour of salvarsan preparations *in vivo* and *in vitro* is the action of anti-icteroides immune horse serum, which, in a dose of 0.0001 c.cm., or 1 c.cm. of 1 in 10,000 dilution, protected guinea-pigs from an infection with at least 5,000 minimum lethal doses of *S. icteroides* when injected simultaneously; but the same serum failed to have any harmful effect when mixed *in vitro* in a concentration weaker than 1 in 2,000. Rapid disintegration of the leptospira occurred in a concentration of 1 in 20, and almost complete agglutination and degeneration with 1 in 200 concentration. The contrast between chemo-therapy, as carried out with salvarsan preparations, and sero-therapy apparently has considerable practical significance.

THE REGISTRAR-GENERAL'S REPORT FOR 1919.

THE eighty-second annual report of the Registrar-General of births, deaths, and marriages in England and Wales has just been issued as a Blue Book of 520 pages.[2] The salient features of the vital statistics of 1919 are summarized by Sir Bernard Mallet in his prefatory letter, dated November, 1920, and addressed to the Minister of

[1] H. Noguchi, *Journ. Exper. Med.*, Baltimore, 1920, xxxii, 381–400.
[2] To be purchased through any bookseller or directly from H.M. Stationery Office. (Cmd. 1017. 7s. net.)

Health. The marriage rate was 19.7 per 1,000; this was the highest on record, and the provisional figures for 1920 indicate a further rise. The birth rate was 18.5 per 1,000, being 0.8 per 1,000 above that recorded for 1918, but 5.3 below that for 1914, which, particularly so far as the birth rate is concerned, may be regarded as the last year unaffected by war conditions. The death rate was 13.7 per 1,000, being, with two exceptions, the lowest on record, notwithstanding the heavy mortality from influenza in the early part of the year. Infant mortality was 89 per 1,000 births, being the lowest rate hitherto recorded, though when allowance is made for a falling or rising birth rate, the rate for 1916 appears to have equalled it. The provisional figures for 1920, printed at p. 178, indicate a further fall, both in the general death rate and in infant mortality. As in other recent reports the mortality of infancy and early childhood is examined in special detail. The death rates from measles, whooping-cough, and enteric fever were by far the lowest on record; on the other hand, deaths from small-pox were more numerous than in any year since 1905. Notwithstanding the influenza epidemic, the mortality from tuberculosis was the lowest on record, and that from pneumonia normal. The deaths from cancer were in accordance with the general movement of cancer mortality in recent years, which has increased much faster among males than females, though for several years before 1919 this increase seemed to have been arrested for both sexes. Cancer, however, forms the one great exception to the general tendency for mortality at most ages to decline. The Registrar-General dwells upon the difficulty of making local estimates of population; this always increases as the last census becomes more distant, and the possibility of error was much aggravated by the movement of population caused by the war. We conclude this brief notice of a great statistical work by observing that the estimated total population in England and Wales in the year under review was 36,800,000, amongst whom the females exceeded the males by as much as 2,438,690. Of the men some 800,000 were estimated to be non-civilians.

OUTBREAKS OF FOOD POISONING.

THE Ministry of Health is anxious to obtain early information, as exact as possible, on all cases of food poisoning. It has therefore requested all medical officers of health to notify the Ministry at the earliest possible stage whenever they have reason to suspect that any death or outbreak of illness in their districts is due to food poisoning. Although neither medical practitioners nor the general public are under any statutory obligation to report cases of food poisoning to the medical officer of health, it is hoped that they will co-operate with a view to safeguarding the public health in this direction, the local health authority being prepared now to authorize any necessary inquiries and investigations—bacteriological, chemical, and otherwise—into the possible causes of an outbreak of suspected food poisoning. The chief causes of food poisoning are: the contamination of foods by inorganic poisons (for example, arsenic, antimony, copper, and lead), and bacterial contaminations, the latter being of much more frequent occurrence, especially in the case of foods of animal origin. Care should be taken to secure samples from all available food materials in cases of food poisoning, apart from those to which suspicion attaches at first sight, as it often happens that a food substance which was not suspected in the first instance is ultimately proved to be the material at fault, especially when the illness is suspected to be due to an inorganic poison. The complete history of each case should be obtained with the least possible delay, as the determination of the circumstances in which food poisoning has occurred often turns upon the elucidation of apparently trivial points, and after some days' interval it is impossible to rely on recollection of them. In addition to the examination of samples of suspected food materials, it is of importance that bacteriological examination should be made of materials from persons affected and particularly of the organs of fatal cases. The exact material required may vary in individual outbreaks, and in all such cases the medical officer of health concerned should consult the bacteriologist entrusted with the examination. His advice should also be obtained in order that the material may be transmitted with proper precautions and in a condition suitable for examination. The serological reaction of the blood of persons attacked, the Ministry emphasizes, should always be bacteriologically investigated.

THE CASE OF DR. DOLLING.

DURING its last session the General Medical Council discussed very fully the case of Dr. Charles Edward Dolling, who was reported to the Council as having been convicted of a misdemeanour at the Westminster Police Court. The magistrate's decision was upheld on appeal at the general Quarter Sessions. As will be seen from the report published in the SUPPLEMENT of December 4th, 1920, p. 155, the case was heard in private; the result was that the General Medical Council decided that Dr. Dolling's name should not be removed from the *Medical Register*. The Council considered the matter *in camerâ*, but its decision, which we understand was unanimous, shows that it accepted without hesitation Dr. Dolling's version of the facts and circumstances leading up to his conviction, and also accepted the unimpeachable testimony as to character that Dr. Dolling produced. As a member of the medical profession, therefore, Dr. Dolling's character is clear, but he held a commission in the Royal Army Medical Corps. He had been in practice in Adelaide, came to England in 1915, and served continuously until October, 1919. We have examined the papers submitted to us by Messrs. Hempsons, the solicitors who represented Dr. Dolling before the General Medical Council, and agree that there has been a grave miscarriage of justice in the courts, owing, probably, to the imperfect manner in which Dr. Dolling's case was originally stated. The only course open to Dr. Dolling is to appeal for a pardon. This appeal is now being prepared, and if successful will render it possible for him to be reinstated in the army.

HOSPITAL INQUIRY COMMITTEE.

THE Marquess of Linlithgow has been appointed, on the nomination of the Secretary for Scotland, to the Committee on the Finances of Voluntary Hospitals appointed by the Minister of Health, and Sir W. B. Peat, of the firm of W. B. Peat and Co., chartered accountants, has been added to the Committee. The composition of the Committee is now therefore complete. It consists of Lord Cave (chairman), Lord Linlithgow, Sir Clarendon Hyde, Sir W. B. Peat, Mr. R. C. Norman, and Mr. Vernon Hartshorn, with Mr. L. G. Brock, of the Ministry of Health, as secretary. Its terms of reference are: "To consider the present financial position of the voluntary hospitals and to make recommendations as to any action which should be taken to assist them." The first full meeting of the Committee was held on Wednesday, January 26th, when evidence was given in the morning by the Hon. Sir Arthur Stanley, Chairman of the British Red Cross Society and Treasurer of St. Thomas's Hospital, and Sir Napier Burnett, Director of Hospital Services under the British Red Cross; and in the afternoon by Viscount Knutsford, Chairman, and Mr. E. W. Morris, House Governor, of the London Hospital.

COMMITTEE ON POST-GRADUATE EDUCATION.

WE understand that the Ministry of Health has appointed a committee to inquire into the position with regard to post-graduate medical education and to report on the steps which the Ministry should take to assist in placing it on a satisfactory basis. The Earl of Athlone, chairman of the Middlesex Hospital, has been appointed chairman of

the committee. The other members of the committee are, we believe, all members of the medical profession, and are representative of the Ministry, of the medical schools, and of the profession generally. In our view it has been shown that for an efficient post-graduate medical school in London a large general hospital will be needed to serve as a central office and meeting place, and for certain types of instruction. Events have proved that to achieve this end a parliamentary subsidy will be necessary.

FEES OF PUBLIC VACCINATORS.

THE minimum fees for domiciliary vaccination are at present precisely the same as they were from 1899 to 1907. From 1907 to 1919, it may be recalled, there was actually a reduction in the minimum fees, in spite of protest on the part of the public vaccinators and of the fact that this was directly at variance with the recommendation of the Departmental Committee of the Local Government Board—a state of affairs which, in view of the greatly increased expense in every department of medical practice, ought not to exist. The Ministry of Health, in the Order of 1919, admittedly removed a grievance of many years' standing, but hardly went far enough, leaving to the boards of guardians themselves the opportunity of making such increases upon the minimum as should be justified by the altered circumstances of the times. The Association of Public Vaccinators has accordingly addressed a circular letter to every board of guardians in England and Wales, pointing out these facts; but this letter, to be of any real advantage, should be followed up by direct application for increased fees, addressed to the individual boards of guardians by every public vaccinator in the country.

THE Hunterian Oration before the Royal College of Surgeons of England will be delivered by Sir Charters J. Symonds, K.B.E., C.B., in the theatre of the College, Lincoln's Inn Fields, on Monday, February 14th, at 4 o'clock.

THE following lectures will be delivered at the Royal College of Physicians of London, Pall Mall East, on Tuesdays and Thursdays, at 5 o'clock: Milroy Lectures—Dr. Martin Flack: Respiratory Efficiency in Relation to Health and Disease, February 17th, 22nd, and 24th. Goulstonian Lectures—Dr. George Graham: Glycaemia and Glycosuria, March 1st, 3rd, and 8th. Lumleian Lectures—Dr. A. Whitfield: Some Points in the Etiology of Skin Diseases, March 10th, 15th, and 17th.

PRESENTATION TO DR. J. A. MACDONALD.

THE following further subscriptions have been received from January 1st to January 24th, 1921, in response to the appeal published in the JOURNAL of July 24th (p. 129), towards a presentation to Dr. J. A. Macdonald on the occasion of his retirement from the office of Chairman of Council of the British Medical Association which he had held for ten years. Subscriptions of any amount not exceeding five guineas should be made payable to "The Macdonald Presentation," and sent to the Medical Secretary, British Medical Association, 429, Strand, London, W.C.2.

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Correspondence.

WILLESDEN MUNICIPAL CLINICS AND HOSPITAL.

SIR,—The situation which has arisen in Willesden calls for energetic action on the part of every Division and Branch in the country. The medical activities of the Health Committee of the Urban District Council threaten to take away nearly all the work of the general practitioner, and possibly also of the consultant, both among mothers and among children up to the age of 14 years now, and ultimately to the end of school life.

May I ask every honorary secretary to consider carefully the following:

1. Each Division of the British Medical Association should carefully examine the annual reports of the medical officers of health in its area at an early date and report at once to its Branch Council or to Dr. Cox any evidence of undue encroachment upon the work of the general practitioner or the consultant.

2. As many practitioners are unfamiliar with the work of the various medical officers of the various authorities, and the relations between these and practitioners are not always so good as they might be, Divisions should arrange meetings to be addressed by these officers, at which their work could be explained and discussed. Begin with the M.O.H., follow with resident medical officers of the isolation hospital, infirmary, and hospitals in the area, medical officers of welfare, school, and tuberculosis clinics, referees to the Pensions Committee, and the National Health Insurance referees.

3. Divisions should consider the formation of a Local Medical Advisory Council (Dawson Report), and in the meantime should appoint a special committee to watch and report on the medical activities of the various authorities.

4. Each Division should invite at least a portion of its non-members to every medico-political meeting, and should consider the advisability of appointing an honorary organizing secretary, whose duty would be to call on non-members, find out their grievances, and induce them to join the Association. The larger the percentage of members and the more non-members are invited to meetings the better can the Division claim to represent the profession in dealing with local authorities and with the Ministry of Health.

5. Larger Divisions should consider whether they could not do better work if divided up into areas, or into new Divisions corresponding to the areas of the local authorities.

We asked for a Ministry of Health, and we have got it. What it is going to be will depend largely on what we try to make it. Now is the time to insist that the family doctor shall receive every encouragement, and to back up Sir George Newman in his opposition to a State medical service, in which I presume he includes a whole-time municipal service.

Doubtless most of us, if we were M.O.H.'s, thinking chiefly of administrative difficulties, would do as the M.O.H. of Willesden proposes; but may I urge him to allow his breadth of vision and his prophetic instincts to come into play equally with his administrative abilities? At present his Health Committee seems to be following a course which must prove disastrous to the profession and ultimately to the public.—I am, etc.,

WILLIAM PATERSON, M.B., Ch.B.Edin.,
Honorary Secretary, Willesden Division.

London, N.W., Jan. 21st.

THE BRADFORD MUNICIPAL GENERAL HOSPITAL.

SIR,—In the JOURNAL of January 15th Mr. Basil Hall of Bradford informed the medical profession that the Bradford Municipal General Hospital "remains the same old obsolete group of buildings which the Local Government Board condemned as unfit for hospital purposes twenty years ago."

Having been intimately connected with the hospital in question for nearly that length of time, I can only suppose Mr. Hall to be either wofully ignorant or wilfully deluded.

In the first place, the Local Government Board has

never condemned any portion of the present hospital buildings, although one block was condemned by me sixteen years ago and was swept away last year. On the other hand, three modern hospital buildings were completed sixteen years ago, having a first-class operating theatre and accommodation respectively for 156 adults, 80 children, and 45 maternity cases. These new hospital buildings compare favourably with any in the country, and I cordially invite Mr. Hall to revisit them and refresh his memory.

In addition, and within the last four years, three other pavilions have been erected and put into use, each accommodating 100 patients. Thus, at any rate, we have 581 beds to which the expression "same old obsolete" hardly seems to apply. Nor is it any more applicable to the medical and surgical equipment of these or of the other and older wards of the hospital.

Mr. Hall says he would welcome "real co-operation" between the Bradford Royal Infirmary and Municipal Hospital. One of the prime essentials of real co-operation being mutual knowledge, I trust the above facts will be of use. I am afraid, though, that Mr. Hall's idea of co-operation in this case implies the conversion of St. Luke's, with its splendid wards and equipment, into a dump, on to which the Infirmary could shoot its patients after giving them the more exciting portions of their surgical treatment. This would make less risky than it is at present the well known procedure by which has been attained the new boast: "*There is at present no waiting list at the Infirmary.*"—I am, etc.,

B. HOLROYD SLATER,
Medical Superintendent, Bradford Municipal General Hospital.

Bradford, Jan. 18th.

PROGNOSIS IN ENCEPHALITIS LETHARGICA.

SIR,—In view of the notice which the disease is now receiving, I am authorized by Sir George Newman to send a brief note on its prognosis so far as it appears from the collection of case reports made by me at the Ministry of Health.

A study of these reports, together with an examination of several old cases, shows that in many instances the later stages of the disease may be very prolonged and the source of much anxiety both to the patient and to his medical attendant. Facial and ocular palsies, marked paresis, and sometimes paralysis, of a limb or limbs, and tremors in the parts so affected, are constantly mentioned as existing after the patient has resumed or partially resumed his normal occupation. In addition, the higher faculties are apt to remain for some time distinctly impaired, so that loss of memory, defects of speech, mental lethargy, and a general loss of intellectual tone result. The character, too, not uncommonly becomes changed, and often for the worse, especially in children. It may be noted in passing that MM. Harvier and Levaditi in a recent paper (*Bull. et Mém. Soc. Méd. des Hôp. de Paris*, December 9th, 1920) support the conclusion reached by Marary—namely, that the sequelae of epidemic encephalitis are often no more than the symptoms of a form of the disease with a prolonged evolution.

It will be recalled that soon after the disease appeared in this country, and prior to January 1st, 1919, when encephalitis lethargica became a notifiable disease under the Public Health (Acute Encephalitis Lethargica and Acute Polio-encephalitis) Regulations, 1918, a special inquiry was initiated by the Ministry with the object of gaining information concerning the epidemiology and clinical characters of the disease. The material for investigation and the knowledge then available were both limited, but a full and carefully compiled report on the subject was issued by the Local Government Board in 1918.[1]

At the time this report was issued the conclusions reached concerning the full course of the disease in individual cases and the ultimate fate of its victims were necessarily guarded and provisional in character. The mortality rate, for instance, in Dr. MacNalty's series of 168 cases worked out at approximately 22 per cent. Of the 541 cases of encephalitis lethargica notified during 1919 from England and Wales no less than 286 proved fatal, a mortality of 54.6 per cent. A later review of this series resulted in the elimination of a certain number of fatal cases by reason of mistaken diagnoses, but even so the death-rate figure remained at 50 per cent.—a mortality which is probably much higher than is generally supposed. The fatality is greatest in those over the age of 30.

I may add, in view of a comment in your leading article of January 15th, that the Ministry of Health, in conjunction with the Medical Research Council, are actively continuing the investigation of this disease in its epidemiological, clinical, and pathological aspects. This co-ordination has already resulted in the successful transmission of the virus of encephalitis lethargica to monkeys in the Derby case, which was reported in the annual report of the Chief Medical Officer of the Ministry for 1919–20. The detailed information regarding notified cases which we are receiving from the medical staff of institutions, medical practitioners, and medical officers of health is proving of great value, not only as material for ultimate tabulation, but as a guide to the selection of cases for special investigation.

Possibly some of your readers can supply information on the after-history of cases notified during 1919, supplementary to that which they have already sent in reply to schedules of inquiry. Any such information would be specially welcome.—I am, etc.,

ALLAN C. PARSONS,
Medical Officer, Ministry of Health.

Whitehall, S.W., Jan. 24th.

[1] Report of an Inquiry into an Obscure Disease (Encephalitis Lethargica, New Series, No. 121).

X-RAY RADIATION AND CANCER.

SIR,—Mr. Sampson Handley's important lecture and the letters in the last issue of the BRITISH MEDICAL JOURNAL raise a question that is likely to claim a more or less rapidly increasing attention on the part of the profession. Dr. Lord's criticisms on the absence of any uniform or satisfactory method of *x*-ray dosage as applied to these cases are well founded, and probably none deplore this more than radiologists themselves. Until quite recently at least, the difficulties surrounding the problem have been very great. Such methods as have been devised have not proved satisfactory in practice, chiefly for the lack of standardization in the various parts of our *x*-ray equipment, all, or nearly all, of them difficult to standardize.

As to the potential value of radiation in malignant disease, this is no longer a matter for argument. Up to the present, even if the proportion of successful cases has been small, it is at least enough to prove we are on the right road. For several years past I have felt sure that radiation would be more likely to provide the much desired "cure for cancer" than anything else within our present knowledge. Given a suitable type and intensity of radiation there is no reason in theory why any localized malignant growth should not be made to disappear, whether it be superficial or deeply seated. Where we have failed in the past it is chiefly from unsuitable and insufficient dosage. Working with the most highly penetrating rays available, the loss of total radiation between the surface of the skin and a depth of 10 cm. below has been something in the neighbourhood of 90 per cent., more rather than less. At the present time, with one single exception, every *x*-ray set in the United Kingdom produces a type of radiation that is not sufficiently near the hard gamma rays of radium in character, and not sufficiently homogeneous to be of any real practical value in the treatment of malignant lesions of the more deeply seated parts.

Uniformly successful irradiation under these circumstances is possible only with *x*-ray tubes having a resistance equivalent to at least 16" of air, in conjunction with a filter thick enough to make the resultant radiation homogeneous. Few radiologists here use filters exceeding 6 mm. of aluminium, whereas to get homogeneous rays with a "gas" tube at least 12 mm. are necessary, and more with the Coolidge tube, since it gives a less homogeneous radiation than the best type of gas tube with water-cooled electrodes. The American Coolidge tube is unsuitable for this class of work owing to the inadequate distance between the electrodes.

Quite recently it was my good fortune to spend a week in the university town of Erlangen, Bavaria, attending several hours daily in the Frauenklinik, under the charge of Professors Seitz and Wintz. The *x*-ray technique there practised is probably the most efficient in existence, and is

due to the efforts of Professor Wintz and his assistants. Not the least interesting fact is that this highly successful system has been evolved not by a radiologist, but by a gynaecologist, who was profoundly dissatisfied with the results of surgery in that class of malignant cases that come under the notice of the gynaecologist, including mammary carcinoma. One outstanding feature of the system is the method of dosage.

Special apparatus and tubes have been designed to give a type of radiation having qualities of penetration and intensity combined such as has been hitherto unattainable, with facilities for reproducing this standard type of radiation at will. Dosage thus becomes a matter of calculation and time, and the results are uniform and successful to a degree that would be surprising were it not quite in keeping with theoretical considerations. Empiricism is almost entirely absent in the matter of dosage, and after a tube has been standardized by instrumental means its radiation value is checked by biological methods before being put into practical use. Moreover, every tube is recalibrated at regular intervals. It is unnecessary to go into further technical matters, but I may be allowed to refer to some more details regarding dosage. Working under the standard conditions it is found that with the proper filter, focal-skin distance, etc., the maximum dose the skin will stand without serious injury will be given in about thirty-five minutes. This will be followed by reddening of the skin in about a week and tanning in about three weeks after, but no ulceration or other destruction of tissue. This is what is called the unit skin dose. Taking this unit skin dose as 100, it has been found that a cancer cell requires 110 per cent. of this to ensure its destruction; less may do so, but the dose must not be under 90 per cent. A dose of 70 per cent. to 90 per cent. will paralyse a cancer cell, so to speak, but it is not certainly destroyed, and may recover. If, however, a dose of only 40 per cent. of the unit skin dose is given to a cancerous growth, the latter is stimulated, causing it to increase rapidly, with serious, possibly fatal, results. Herein lies the explanation of some of our failures in the past. In our relatively feeble efforts to cure our patients we have attained this "virile" dose, hastening the very end we were doing our best to avert.

In view of these facts—and I have satisfied myself at least that they are substantially correct—a little consideration will show that our methods will have to undergo considerable modification if we are to ensure the degree of success we aim at. Supposing we are dealing with a case of uterine cancer, it is found that when we apply the unit skin dose to the skin over the symphysis only 18 per cent.—approximately—reaches the cervix, dispersion and absorption accounting for a loss of 82 per cent. Consequently we must use at least six ports of entry, all accurately directed towards the growth, if we are to ensure success, and these six doses must be given on the same day. The parametria will have to be similarly treated at intervals of eight and sixteen weeks respectively, such intervals being necessary to allow the blood and tissues to recover. In dealing with mammary and other relatively superficial cancerous growths we are limited practically to one port of entry and our technique has to be modified. The only method of getting even irradiation throughout a superficial growth is to set the tube some distance away—anything from 70 cm. to 100 cm., according to circumstances. Naturally this involves a serious loss by dispersion that can be made up only by a prolonged exposure which may be from five to ten hours or even more. This no doubt sounds formidable and to many may seem difficult, but it is not only practicable but successful. To go further into details would serve no useful purpose just now, and I shall conclude by giving some figures relating to results attained in the Frauenklinik at Erlangen, that give cause for serious reflection. I have been satisfied as to their substantial correctness, and I would ask those who may be disposed to question them to bear in mind that I have been there to investigate for myself, and that the type of radiation and the technique employed are entirely different from anything that has been done in this country up to the present. It will be assumed, of course, that cases in which dissemination had begun were not treated if there was any evidence of this fact.

In the year 1918 twenty-four cases of uterine cancer, with more or less involvement of the parametria, were treated with the x rays alone. At the present moment twenty of these are quite well and leading normal lives, being at least clinically cured. In some, fragments of suspicious-looking tissue were removed for microscopic examination, with negative results. In one case the treatment had no appreciable effect, for reasons that are not clear. In the other three dissemination had begun, though there was no evidence of this at the time. The primary lesions disappeared, but the patients died from distant extensions. Turning to mammary cancer we find that exactly 75 per cent. of such cases treated in 1917 by the x rays alone are now clinically cured.

With the constant improvement in equipment and technique better results are expected for subsequent years, but that even these results can be attained by means of the x rays alone is sufficiently remarkable to give rise to a conjecture that our present methods of dealing with malignant disease are likely to undergo considerable modification in the near future.—I am, etc.,

London, W., Jan. 22nd. REGINALD MORTON.

INFECTION OF THE SUPRACLAVICULAR REGION IN CANCER OF THE BREAST.

SIR,—I have been very interested in the letter of Mr. Parry published in the JOURNAL of January 15th (p. 99), relating his experience of the frequency with which, when operating for cancer of the breast, he found the glands above the clavicle revealed, on microscopic examination, evidence of cancerous infection. I have, in operating for cancer of the breast, for more than twelve years as a routine practice removed the fatty tissue, and contained glands, from the supraclavicular region, following the practice of some of the American surgeons, as although I recognized that it was not common to find cancerous glands there, yet occasionally they were discovered on opening up the supraclavicular space, though there was no evidence of their presence before operation. The supraclavicular extension of the operation was carried out in all cases except those in which it seemed desirable to shorten the time of the operation for some definite reason, or the primary growth was exceptionally small, and the axillary glands were not found to be involved at the operation. In the cases in which it was carried out it did not materially add to the risk of the operation. If we find in the supraclavicular region cancerous glands, of some size, which have to be removed from under the sterno-mastoid, and are in intimate relation with, or even adherent to, the internal jugular vein, and other important structures at the root of the neck, then removal does, of course, involve a very definite increase of risk, but I am now writing of an extension of the breast operation, which consists in clearing out the fat of the supraclavicular region, and all contained small glands, of the same nature as the routine removal of the axillary fat and glands.

Since reading Mr. Parry's letter I have looked through my records of operation for cancer of the breast from July, 1908, to October, 1911 (three years and three months), and in that period I find I operated on 38 cases. From these we must deduct 8, as in 4 cases the supraclavicular extension of the operation was not performed and in 4 cases glands could be felt above the clavicle before operation. Out of the remaining 30 cases, in only 3 did I find cancerous growth above the clavicle; in most of the cases in which there was no supraclavicular cancerous growth there was cancerous growth in the axillary glands, and in a few quite extensive growth, certainly in one case reaching up above the upper border of the pectoralis minor. But though it is evident that cancerous growth, at least as judged by naked-eye inspection, is not common above the clavicle, yet it is evident that in one case in ten, if I had not as a routine practice cleared out the supraclavicular tissue, I should have left nodules of growth there, and as this extension of the operation to the supraclavicular region involves no material risk, it does seem to me that it should be carried out as a routine practice, except in cases in which for some special reason it is contraindicated. Of course it may be that the small glands I frequently removed with the supraclavicular fatty tissue would, if they had been examined microscopically, have shown evidence of cancerous infection, as the glands Mr. Parry removed did, but I do not think they would. My experience is that one more often finds that a gland one is suspicious may contain secondary growth, is not found on microscopic examination to do so. I cannot say that in the three cases in which I did find nodules of growth or infected glands above the clavicle, those nodules were microscopically examined, but they were absolutely typical to the naked eye.—I am, etc.,

Bristol, Jan. 23rd. CHARLES A. MORTON.

RISKS AFTER OPERATION ON TONSILS AND ADENOIDS IN OUTDOOR CLINICS.

SIR,—The paper of Mr. E. Watson-Williams, bringing forward the risks and increased morbidity following this method of treatment, deserves the thanks of the profession and public. The correspondence since the publication of this article shows that there is a general agreement as to the unsatisfactory manner in which this work is carried on.

Although I no longer practise this work, I accede to a request to give my opinions on the subject, for I have long felt that it was highly unsatisfactory. After some years I eventually abandoned the out-patient treatment of these cases and only operated on such as could be admitted to the wards, although a large number still continued to be dealt with in the out-patient department.

It seems to me that these hospital patients should have the same facilities that we demand for private patients, first, because it is safer, and any complication, such as reactionary haemorrhage, can be dealt with readily by the surgeon or his assistants, and, secondly, because it is more humane. The recovery room after such a morning's work as usually obtains in most hospitals performing this type of work is a sight which no one with reasonable compassion can bear to witness. Add to this the preliminary starvation, the horrors of the operating theatre, and the aforesaid room, together with perhaps a tram or train journey afterwards, should make any one pause before countenancing such operations. I speak from personal experience of this method, and it would need a much more facile pen than my own to describe the feelings of a train journey after such an operation. Of course, it may be the lesser of two evils to operate under such conditions rather than not operate at all, but I have remarked on many occasions that were our patients perhaps something less than human we should have probably more humane means of dealing with them. I have also often wondered what an inspector of the N.S.P.C.C. would think could he be present during a morning's work!

Our present hospital system, or perhaps rather the want of it, is at the root of the matter, for the poor voluntary hospitals are no doubt doing their best to cope with the large amount of work thrown on to them by the various Government inspecting agencies. It is to be hoped that this matter, which has been ventilated before, may now be settled, so that the better and more humane method may become the established one.—I am, etc.,

Newcastle-on-Tyne, Jan. 24th. F. C. PYBUS.

SIR,—As Dick Phenyl remarks in *Sweet Lavender*, "Blame, blame, but never a word of praise." Surely one may be allowed to put in a mild and deprecatory protest on behalf of the methods of those of us, not eminent otologists, who week by week have the duty of dealing, as out-patients, with large numbers of children seriously handicapped by adenoids and enlarged tonsils.

At a time when railway bookstalls are pushing the sale of a book by a physician who undertakes to prove that operations on the throat are harmful and unnecessary, is it wise for medical men to join in a loud chorus of condemnation of present procedure, and even to suggest the issue of an appeal to the lay press in popular language? Is it not a fact that the alleged dangers of outdoor clinic treatment have been shown by experience not to be so very great after all? Are not fatalities known in the houses of the rich even when the patients are surrounded by the greatest precautions against disaster, and do no complications ever occur in well appointed nursing homes? At the London County Council school treatment centres printed directions as to treatment before and after operation are given, and the nurses present at the operation follow up the case at home and pay frequent visits. At the Hammersmith School Treatment Centre 1,608 children have been operated on with no mortality, direct or indirect; there has been one case of severe primary haemorrhage which would have taken place in any hospital, whilst the few cases we have had of secondary haemorrhage have occurred on the third to the seventh day, showing that twenty-four hours' detention in hospital would not have been of much service.

When one considers the large number of children—stupid, deaf, unhealthy, with restless, unrefreshing nights—who are converted into normal beings by operation, to say nothing of those chronic otorrhoeas which often clear up like magic, ought we not to find matter for congratulation in the net result achieved, and not waste time in advocating the impossible?—I am, etc.,

WALTER E. FRY, M.R.C.S., L.R.C.P.,
Surgeon, L.C.C. Hammersmith School Treatment Centre.

January 24th.

TUBERCULOUS MILK.

SIR,—Recent correspondence in your columns has revealed considerable diversity of opinion regarding the infectivity of bovine tuberculosis to man. At the last meeting of the Council of the Society of Medical Officers of Health representations on the subject were received from the Tuberculosis Group and individual members of the society, and the following resolutions were adopted unanimously:

(*a*) That in the opinion of this society it has been conclusively proved that bovine tuberculosis is transmissible to children through the ingestion of infected milk.
(*b*) That this society regards the evidence of immunization by the ingestion of living tubercle bacilli in milk as entirely unproved.

I was directed to forward you a copy of these resolutions for the information of your readers.—I am, etc.,

G. S. ELLISTON,
Executive Secretary, Society of Medical Officers of Health.

1, Upper Montague Street, W.C.,
Jan. 22nd.

THE PREVENTION OF VENEREAL DISEASE.

SIR,—The present controversy regarding venereal disease prophylaxis would be welcomed by the medical profession if the protagonists would call a truce to recrimination and turn their minds to the more profitable channels of constructive policy. To this end they would do well to consider the last paragraph of Sir Archdall Reid's letter.

There are, in fact, two problems of venereal disease prophylaxis to be considered; the one dealing with the present generation is urgent and demands emergency measures. The Society for the Prevention of Venereal Disease is taking such measures. Their remedy is of necessity partial and imperfect, but so long as they realize that their method of attack is adapted only for the urgent needs of the moment, there can be little cause for concern about the effect on the morality of the people.

The second problem, affecting our children and generations yet unborn, requires more careful investigation and wider vision.

Now, there exist in this country three great institutions for the teaching of the young—the home, the Church, and the school. Of these, the home is the ideal place for early and continuous instruction in clean and healthy living; but, unfortunately, home teaching is not available at present on account of the ignorance of the parents themselves. The Church, however, is too preoccupied with creed and observance to realize that the teaching of conduct, rather than faith, is the crying need of our time. For the future it has great possibilities, but for the present we must trust to the school.

In school the growing child can be taught day by day the principles of three great sciences: History, dealing in broad outline with the development of the human race; biology, beginning with the everyday phenomena of plant and animal life, and leading up to the fundamental facts of human life and reproduction; and citizenship, the science of conduct, of the relation of individuals to one another, to the State, and to mankind. The teaching of a clean, healthy way of life is of immediate and paramount importance. In addition, the course of citizenship should include instruction on the great social problems of the day, among which that of venereal disease occupies a significant position.

It is the plain duty of the educational and medical authorities to unite in preparing a thorough systematic course on these lines. The matter is urgent.—I am, etc.,

Sherborne, Jan. 24th. J. M. MACKINTOSH.

SIR,—Dr. Wansey Bayly, in your issue of January 1st, accused me of indifference to the ravages of venereal disease among the innocent. Such is not the case, and I think there is evidence in the correspondence in the last

few weeks to maintain the view that the innocent can, in the long run, only be protected by a high standard of honour among men. He also said that I ignore the problem as it exists at the present moment, and he then at once went back more than two years—to the war. The men who acquired venereal disease in the war were subjected to an intensity of temptation, combined with a shattering of the nervous system, such as is not the case to-day.

Venereal disease is the price that will always have to be paid for war, and the only way to prevent an epidemic of it in future is to work to prevent war. But it is the healthy young man entering on life to whom the Society for the Prevention of Venereal Disease is issuing its leaflets. To a man who has already acquired it, in the war or after, the word prevention does not apply, and no amount of leaflets or permanganate will prevent him from spreading the disease. His case is met by the venereal clinic.

The mere fact of advocating preventives assumes the possibility of a lapse. Once a man makes that admission he is unsafe and probably will run the risk, and, as the preventives are admittedly not absolutely certain, the fact of advocating them becomes a source of augmenting not decreasing disease. Dr. Otto May's parody in your issue of January 22nd hits the mark, and if one substitutes "Father, to John, aged 18," for "Mother, to Mary, aged 14," the case is complete. I trust that ridicule may be the best weapon to clear the air of this nauseous moral miasm that is being set loose in certain quarters.—I am, etc.,

H. B. GLADSTONE.

London, S.E., Jan. 24th.

MUSCLE RE-EDUCATION.

SIR,—The recent discussion on this subject in your pages ended by revealing apparently irreconcilable differences of opinion amongst different schools of experts as to the fundamental principles of muscular re-education. The question need not be left in this unsatisfactory position, since we have certain working hypotheses by which to test the claims made on behalf of any system of treatment of markedly disabled skeletal muscles. Thus the "submaximal exercise load" and the "limit of fatigue" are recognized guiding principles in all muscular work. Further, all are agreed that "voluntary contraction" of muscle has far more therapeutic value than any vicarious simulation of the same induced by mechanical or electrical stimulation. There is also general agreement that "voluntary" exercise of a weak muscle should be selective for that muscle. The principles of the submaximal load, or the fatigue limit, and of a voluntary selective exercise, are of special importance in re-education of weak muscles.

Take now the Swedish system of re-education and the system described by Dr. W. Colin MacKenzie in his well-known book, and test the claims made for each by their compliance or otherwise with the principles outlined above. Assume that one is dealing with the case of a deltoid muscle disabled by myelitis of related spinal neurosis. A Swedish expert would treat a muscle in such a condition by massage, later by passive movements, and as the power of voluntary contraction returns by active eccentric and concentric movements, that is, by "isolation" contraction-relaxation of the weak muscle. All movements are guided by the expert. This system of treatment is thus based on the assumption that the patient cannot control and voluntarily exercise and accurately load his own muscle without the manual aid of the "teacher." Now there is nothing in what is known of the mechanics, physiology or psychology of the action and re-education of muscles which justifies such *a priori* assumptions. Apart from theoretical considerations we have the demonstrated fact that a patient can, by his own unaided voluntary effort, control and exercise and accurately load a disabled muscle from the beginning of the recovery of function. Colin MacKenzie describes fully one method whereby this may be done, and others employing the same or similar methods have confirmed the results obtained by him.

The advantages of the natural method of "free" uncontrolled over a manually-controlled method of training are very great. First, the patient's interest in and attention for the skilled work of retraining his own muscle is easily aroused and maintained; the process is one of "re-education" in the true sense of the term. Further, the patient puts on the exercise load, guiding his output of effort by his own feeling of power, or want of power, in carrying out the movements prescribed by his teacher, and the output of effort is checked by the fatigue induced by the exercise. Overloading and overwork are by these means avoided. Most important of all is the demonstration which we owe to Colin MacKenzie, that voluntary selective exercise of the muscle can be successfully carried out from the commencement of recovery of function of the "injured" anterior neurones—that is, in the hypothetical case we are considering. The rhythm of rest and exercise must, of course, be skilfully adapted to the functional condition of the muscle and postural rest must be maintained continuously between the intervals of selective exercise. Under the Swedish system exercise is not "voluntary" in any psychological sense of the term. The Swedish expert puts on the muscle load according to his (the expert's) estimate of the power, or want of power, of the muscle, and the fatigue limit of exercise may readily be passed.

By selective exercise is meant that the muscle undergoing training is made to do work as prime mover or as fixative muscle. This selective training with postural rest is continued until the muscle is capable of doing full postural and phasic work in free movement or fixation of the part. Space does not permit me to discuss the relation of reflex "unconscious" and automatic and voluntary associative re-education to the selective process I have been considering, or impediments to the re-educative processes.

No skill in re-education will recreate a completely atrophied spinal neurone. But there is every reason to believe that excessive postural and phasic exercise of the muscle may result in atrophy of recovering neurones and in elongation and atrophy of the muscle, with resulting dropped shoulder, wrist or foot, or other deformities and disabilities that are all too common late effects of the spinal anterior poliomyelitis. These results of unskilled re-education of function are mainly due to the failure to realize the cardinal importance of the principle of the submaximal exercise load and the great value of selective free voluntary exercise in the retraining of disabled muscles. I have employed, or seen employed, the Swedish method and the electrical-contraction method in large numbers of cases of muscular disabilities, and I owe to Dr. C. MacKay an introduction to the method of Colin MacKenzie. I have employed this latter method, modified as experience indicated, in cases of infantile paralysis and in a large number of cases of locomotor disability resulting from war wounds, and I have come to recognize the great value of the clinical research work of Colin MacKenzie. Is it too much to hope that we will soon hear the last of the Battle of the Schools—whether Swedish, German or another—and that all re-education experts will concentrate on scientific research into the many still obscure problems of re-education of function of neuro-muscular and muscular disabilities?—I am, etc.,

C. FORBES,
Late M.O. for Re-education of Muscles, Alder Hey Military Hospital, Liverpool.

Aberdeen, Jan. 16th.

PATENT DUCTUS ARTERIOSUS.

SIR,—I read with interest in your issue of December 25th, 1920, Dr. Carey Coombs's account of four cases which lived to adult life; and, in your number of January 15th, Mr. Wilson Hall recalls three infantile cases.

The latter observer noted that no bruit could be heard in any of his cases, and in the only case I have seen I made a similar observation.

This was an infant in the first day of life. He cried lustily at birth, but within an hour became dyspnoeic and cyanosed, when I was called in by the midwife in attendance. The heart was beating forcibly, but no murmur was audible. All attempts at artificial respiration were fruitless, and at autopsy a wide patent ductus arteriosus was found connecting the left pulmonary artery with the commencement of the descending aorta.

A very interesting point in the case is that this was the third child the mother had lost in this way—namely, progressive dyspnoea and cyanosis, leading to a fatal termination; the first child lived two weeks, and the second three days. I was not in attendance on either occasion, and, unfortunately, no necropsies were performed, so that the diagnosis cannot be regarded as certain, but from her description I have no reason to doubt that a similar condition was present.

She has one living, healthy child, but this was by her first husband. A physical examination of her present husband revealed nothing which might throw a light on the mystery.—I am, etc.,

A. R. C. DOOELY, M.B., B.S.Lond.

Surbiton, Jan. 18th.

THE NAVAL MEDICAL SERVICE.

SIR,—I have seen no reply up to date to the letter of six aggrieved naval medical officers, dated December 1st, which appeared in your JOURNAL of December 11th. I quite agree with them in principle, but I would like to qualify two of their points. In the first place—"It is an undisputed fact that the great majority of newly qualified men who join the branch do so with no knowledge of the service." I agree with that, but the same thing applies to every other branch, and moreover, the medical student is often impressed with the idea that there is nothing to do in the navy, with a nice pension to look forward to after years of leisure. This attracts a class of man who is no use either in or out of the service. Such men after joining just sit down and grumble, and in the meantime neglect the opportunities which are at hand. In regard to "status" with the executive officer, a medical officer's status is just what he makes it; the status of the idler and grumbler is not high.

There are two sides to every question. What has the average naval surgeon done for the service? What is his status with the general medical profession? Without the British Medical Association at his back, how would he stand on his own merits? He has no grounds for comparing the Naval Medical Service with the Army Medical Service. The British Royal Army Medical Corps has made itself a pattern of efficiency to the rest of the world by hard work and by making a special study of the requirements of the service. They have justly earned any emoluments they have got. Contrast with the navy. Naval medical officers, with some exceptions, have not adapted themselves to their surroundings. They have not sufficiently considered the requirements of naval service. They have in turn compared their position with the army surgeon and the civil practitioner without realizing that the requirements of the navy are as special and as different from either as the work of the army surgeon is from the civil.

Granted that clinical material is lacking in the navy, interesting clinical material is not the stuff a navy is made of—nor a nation, for that matter; but surely the navy offers other fields of greater usefulness and of equal interest to a medical officer. Men in the navy are passed in as physically fit. It is our job, therefore, to keep them fit. A study of the diseases prevalent in the navy shows that they are, to a great extent, preventable, and yet what have we done in that direction? The subject is a life's study. Lind, Trotter and Blane, our illustrious predecessors of the last century, pointed out the way. Had we followed their example, the Naval Medical Service would not be in its present humble position; we should not have to look to other countries for information on the ventilation of ships; we should not have to grumble about recognition, about status, about pay, about honours, etc. We should have won everything on our merits. Every workman is worthy of his wage.

It is high time, therefore, that we put an end to grumbling and put our heads together to set about making the Naval Medical Service a worthy unit of the great service to which we belong. The rest will follow.—I am, etc.,

January 24th. SURGEON COMMANDER, R.N.

Universities and Colleges.

UNIVERSITY OF OXFORD.

Lectures in Clinical Medicine and Surgery.

THE Regius Professor of Medicine, Sir Archibald E. Garrod, K.C.M.G., is conducting a course of clinical lectures on Tuesdays, at 2.30 p.m., at the Radcliffe Infirmary. Courses of clinical lectures are also being given by the Litchfield Lecturer in Medicine, Dr. W. Collier, and by the Litchfield Lecturer in Surgery, Mr. A. P. Dodds-Parker, F.R.C.S.

Scholarships in Natural Science.

An examination for scholarships in natural science is announced at Merton, Exeter, New, Brasenose, and Corpus Christi Colleges, beginning on June 28th.

At Jesus College the following elections to exhibitions in natural science are announced: G. M. Dyson, C. Hutton, K. P. Osborne, M. H. Evans, W. G. Rees, H. W. Jones.

At a congregation held on January 20th the degree of Bachelor of Medicine was conferred on T. S. Nelson and H. G. Burford.

UNIVERSITY OF CAMBRIDGE.

AT a congregation held on January 21st the following medical degrees were conferred:

M.B., B.CH.—R. C. P. Whitcombe, D. W. R. Richardson, W. S. Sykes.

B.CH.—J. M. Lawrie, J. L. Potts, F. S. Maclean, F. G. Wood, G. P. N. Richardson.

UNIVERSITY OF LONDON.

LONDON HOSPITAL.

THE Liddle Triennial Prize, in the gift of the London Hospital, has been awarded to Surgeon Commander S. F. Dudley, O.B.E., M.D., R.N., and Professor James McIntosh, M.D.

UNIVERSITY OF EDINBURGH.

A MEETING of the University Court was held on January 17th. Professor Lorrain Smith, Dean of the Faculty of Medicine, was elected one of the delegates to a Congress of the Universities of the Empire to be held in London and Oxford in July. Dr. J. Stewart Fowler, a senior lecturer in the Faculty of Medicine, was appointed a member of the Faculty. It was agreed to revive the course on advanced morphology of the vertebrata, which had been suspended since 1914. Dr. Henry Yellowlees and Dr. William M'Allister were appointed university assistants to the Professor of Psychiatry.

Dr. H. D. Wright, of the Department of Pathology, has tendered his resignation on appointment as assistant to the Superintendent of the Laboratory of the Royal College of Physicians. Professor Kynoch has been appointed joint representative of the University Courts of the Universities of St. Andrews and Edinburgh on the Central Midwives Board for Scotland.

UNIVERSITY OF MANCHESTER.

PROFESSOR SIR WILLIAM THORBURN has resigned the Chair of Clinical Surgery, and at the last meeting of the Council and Senate the following resolution was passed:

That the Council and Senate have heard with deep regret of the resignation by Sir William Thorburn, C.B., K.B.E., M.D., F.R.C.S., of his position as senior honorary surgeon to the Manchester Royal Infirmary, which involves also his resignation of the Chair of Clinical Surgery in the University. The Council and Senate desire to express to Sir William Thorburn their high appreciation of the great services which he has rendered to the university during his long connexion with it as a teacher; of the contributions he has made to the advancement of knowledge in surgery, and of his distinguished record and skill in the practice of his profession. The regret which Sir William Thorburn's friends and colleagues feel at the termination of his official connexion with them is increased as they recall the high qualities and devotion which he has brought to the administrative side of his university work, and the geniality and consideration which he has always shown towards his colleagues.

The University Prize in Medicine has been awarded to L. J. Witts.

Dr. A. H. Holmes and Mr. Geoffrey Jefferson, M.S., F.R.C.S., have been appointed lecturers in applied anatomy.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

HUNTERIAN LECTURES.

THE following arrangements are announced for the forthcoming Hunterian Lectures to be delivered in the theatre of the college, Lincoln's Inn Fields, at 5 p.m.: Mr. W. Sampson Handley will give one lecture on the pathology and surgery of lupus on Monday next, January 31st; Mr. W. G. Howarth will give one lecture on mucocele and pyocele of the nasal acessory sinuses on Wednesday, February 2nd; Mr. C. W. Gordon Bryan will give one lecture on injuries of the diaphragm, with special reference to wounds jointly involving thoracic and abdominal viscera, on Friday, February 4th.

LONDON INTERCOLLEGIATE SCHOLARSHIPS.

THE London Intercollegiate Scholarships Board announce that twenty-three scholarships and exhibitions of an aggregate value of about £2,450, open to men and women, and tenable in the Faculties of Arts, Science, Medical Sciences, and Engineering of University College, King's College, East London College, and Bedford College, will be offered for competition on May 3rd next.

Seventeen medical entrance scholarships and exhibitions, of an aggregate value of about £1,580, tenable in the Faculty of Medical Sciences of University College and King's College, and in the Medical Schools of Westminster Hospital, King's College Hospital, University College Hospital, the London (Royal Free Hospital) School of Medicine for Women, and the London Hospital, will be offered for competition on June 28th.

Full particulars and entry forms may be obtained from the Secretary of the Board, S. C. Ranner, M.A., The Medical School, King's College Hospital, Denmark Hill, London, S.E.5.

Obituary.

DAVID YELLOWLEES, M.D.EDIN., LL.D.GLASG.,

Late Physician-Superintendent, Royal Glasgow Asylum.

THE death took place, at Edinburgh, in his eighty-fifth year, of Dr. David Yellowlees, formerly physician-superintendent of the Royal Glasgow Asylum, Gartnavel. Dr. Yellowlees was a native of Stirling, where he received his early education, and he proceeded to Edinburgh University, graduating M.D. in 1857. After an appointment as house-surgeon at Edinburgh Royal Infirmary and a period of study in Paris he became assistant to Sir William Gairdner, physician to the Edinburgh Royal Infirmary. Later he was appointed assistant physician at the Royal Edinburgh Asylum, Morningside, remaining there until 1863. In that year he became superintendent of the Glamorgan County Asylum, where he remained twelve years, building up a reputation as an administrator and physician of distinction.

In 1875 Dr. Yellowlees was appointed physician-superintendent of the Royal Glasgow Asylum, Gartnavel, a post which he held till his retirement in 1902. Under his administration this institution grew and flourished, and Dr. Yellowlees became well known throughout Scotland as a consultant in mental diseases. He was lecturer on insanity at Glasgow University; president of the Psychological Section of the British Medical Association at the Glasgow Meeting in 1885; and president of the Faculty of Physicians and Surgeons of Glasgow during 1892–94. In 1888 he received the degree of LL.D. from the University of Glasgow. In addition to the many marks of recognition he received in this country, he was elected an honorary member of the American Medico-Psychological Association, of the Moscow Society of Neurological and Mental Diseases, and of other foreign societies. Dr. Yellowlees took a leading part in the philanthropic life of Glasgow; since 1910 he had been chairman of the Broomhill Home for Incurables; he was one of the founders of the Glasgow Association for the Care of Defective and Feeble-minded Children; he was active in the inauguration of the Lanfine Home for Advanced Cases of Consumption; and he took a warm interest in many other branches of public work. He was highly esteemed for his strong common sense and his high sense of duty by all who knew him in connexion with public affairs, while his deep religious convictions moulded and coloured his whole life.

After his retirement Dr. Yellowlees continued to live in Glasgow until the autumn of 1919, when he removed to Edinburgh. He is survived by his wife, his daughter, and two sons, one of whom is Dr. David Yellowlees of Stirling, and the other Dr. Henry Yellowlees, senior assistant physician at the Royal Edinburgh Asylum, Morningside.

RUPERT FARRANT, M.C., F.R.C.S.ENG.,

Late Assistant Surgeon, Westminster Hospital.

MR. RUPERT FARRANT, whose untimely death last week, at the age of 36, came as a shock to his many friends, was a man of singularly winning personality and great ability. He was educated at the Westminster Hospital, and studied also at King's College and St. Bartholomew's. After qualifying M.R.C.S. and L.R.C.P. in 1906, he held a good many resident posts at his own and other hospitals, eventually becoming Surgical Registrar at Westminster. He obtained the Fellowship of the Royal College of Surgeons in 1909. He was specially interested in the ductless glands, and did a great deal of research work on thyroid function in health and disease, in the laboratory of Professor Cushny at University College and elsewhere. His assiduity in the collection and examination of thyroids from cases of disease of all kinds from asylums, infirmaries, and hospitals, was remarkable. He formulated a theory of a correlated cycle of changes in the histological appearances and functional activity of the gland under the influence of toxins, and was particularly interested in the relation between deficient thyroid action and some forms of insanity.

Rupert Farrant saw active service throughout the war at Gallipoli, in Egypt, Mesopotamia, and in France, where he gained the Military Cross. He suffered severely from trench fever and was seriously injured by a shell explosion. While still in France he was elected to the honorary staff of the Westminster Hospital, and took over his duties as soon as he was demobilized. His health was, however, much impaired, and though the renal trouble left by the trench fever got better, he never recovered completely from the shell concussion. Feeling himself unable to carry out his duties as he would have liked, he resigned his appointment some months ago, and had been resting in the country up till the last.

ARTHUR JACKSON, F.R.C.S.ENG.,

Shrewsbury.

WE regret to announce the death, on January 9th at Shrewsbury, of Mr. Arthur Jackson.

Born at Grays, Essex, in 1855, son of the late Daniel Jackson, of Chadwell Place, Grays, he was educated at Brentwood, whence he proceeded to St. Bartholomew's. He qualified in 1878 and became F.R.C.S.Eng. in 1882. After holding resident appointments at St. Luke's Hospital, London, and at Beckett Hospital, Barnsley, he went to Shrewsbury, where in 1884 he joined the late Mr. J. R. Humphreys, then senior surgeon at the Salop Infirmary, in partnership. He was appointed surgeon to the Salop Infirmary in 1890, the other surgeons being H. J. Rope, who died twenty years ago, and Mr. W. Eddowes, now living in retirement at Bath. Those were difficult days in the hospital surgical world, when the Listerian system of wound treatment was only being tardily recognized, and Mr. Jackson, as an ardent supporter of the new principles, had much hard work to accomplish. He also witnessed, as the result of the new surgery, the invasion of many new areas of work, and was a keen disciple of such men as Mayo, Horsley, Freyer, and Moynihan. A bold and resourceful surgeon, Mr. Jackson soon acquired a very large consulting practice in Shropshire and the adjoining counties of Mid Wales, where his energy and quiet determined manner made him always the friend in need of his country brethren.

He was surgeon also to the Newtown Infirmary, Montgomeryshire, and to the Wenlock and Brosely Hospitals in Shropshire, and to the Bicton Asylum and the Tuberculosis Sanatorium at Shirleet. Notwithstanding these hospital appointments with their many urgent calls, it was often remarked that he always seemed to have time to attend to the individual matter in request, and that he never refused help nor seemed to be hurried—no one ever applied to him in vain. He was for many years a great supporter of the British Medical Association. He was president of the local Branch in 1899, when he read a paper on "Diseases of the breast," which contained much closely reasoned observation and carefully deduced indications for treatment.

During the war stress of work fell heavily upon Mr. Jackson. He was due to retire from his arduous duties as senior surgeon to the Royal Salop Infirmary in 1915, but at the request of his colleagues he willingly consented to remain at his post, and only vacated it in November, 1919. Early in December last he had received by telegram the sad news of the sudden death in India of his only son, Arthur H. Conway Jackson, I.C.S. He was thus, stricken with grief, little able to withstand the onset in the first week of the new year of an attack of influenza of a virulent nature, complicated by double pneumonia.

He married Florence Eleanor, youngest daughter of the late Rev. S. Sunderland, Vicar of Penistone, Yorkshire, by whom, together with a daughter, he is survived. A memorial service was held at St. Chad's Church, Shrewsbury, on January 12th, which was very largely attended by his professional brethren from far and near, and he was afterwards laid to rest in the general cemetery, in a certain part where lie several of his former fellow-workers.

MANY readers will be grieved to hear of the death of Dr. EDWARD COLLINS BOUSFIELD, which took place suddenly on January 7th, from the rupture of an unsuspected aneurysm. He had had several serious illnesses in recent years, some of them contracted in the pursuit of his pathological duties. He devoted the times of convalescence to sea voyages, and in this way he visited the East and West Indies and Africa. He returned from his last voyage in good health, and we were hoping for years more of fruitful work. He studied at St. Bartholomew's Hospital, and qualified L.R.C.P., M.R.C.S., in 1878. He spent a number

of years in general practice in the Old Kent Road, doing a good deal of research work at the same time. He was an early authority on photomicrography, and wrote a useful manual upon the subject. On his appointment to the position of bacteriologist to the metropolitan boroughs of Camberwell and Hackney and director of the Camberwell Research Laboratories he went to reside at Denmark Hill, where he remained to the end. He leaves a widow and three sons and a daughter. The youngest son is also in the medical profession, and is, we understand, carrying on with the old staff his father's work at Camberwell. Dr. Bousfield had a striking personality, and all who knew him set a high value on his friendship. He was a keen investigator, having an alert mind, a well balanced judgement, a thirst for truth, and a special aptitude for the practical application of new knowledge.

The Services.

HONOURS.

MENTIONS IN DISPATCHES.

THE names of the following officers have been brought to the notice of the Secretary of State for War by Lieut.-General Sir J. A. L. Haldane, General Officer Commanding-in-Chief, Mesopotamian Expeditionary Force, for distinguished and gallant services and devotion to duty, and are recommended for special recognition :—Captains: W. Adams, R.A.M.C.(S.R.), L. G. Blackmore, R.A.M.C.; R. R. Thun Oo Tha, I.M.S.; Sub-assistant Surgeons: Abdulmia Ahmedia Bukhari and Hashim Ali Khan, I.M.D.

DEATHS IN THE SERVICES.

Major James Sydney Pascoe, D.S.O., R.A.M.C., died in the Military Hospital at Poona on December 29th, aged 43. He was the fourth son of the Rev. S. Pascoe of Newquay, was educated at Charing Cross Hospital, and took the M.R.C.S. and L.R.C.P.Lond., in 1904. After holding a house-surgeoncy at Charing Cross, he entered the army as lieutenant in 1905, and attained the rank of major on October 15th, 1915. He served in the South African war in 1900-01, as a combatant, in the Imperial Yeomanry, taking part in the operations in the Orange Free State and in the Transvaal, including the action at Wittebergen, and gained the Queen's medal with four clasps. In the late war he was twice mentioned in dispatches, in the *London Gazette* of May 29th, 1917, and for the Indian frontier campaign on July 10th, 1919, received the 1914 star, with the war medal and Victory medal, the D.S.O. on June 3rd, 1917, and the Legion of Honour (Chevalier) on February 24th, 1915.

COMMITTEE ON POST-GRADUATE MEDICAL EDUCATION IN LONDON.

As we go to press the composition is announced of the Committee appointed by the Minister of Health, with the concurrence of the University Grants Committee, to formulate a scheme for post-graduate instruction in medicine in London.

The terms of reference are: "To investigate the needs of medical practitioners and other graduates for further education in medicine in London, and to submit proposals for a practicable scheme for meeting them."

The Chairman, as stated in the JOURNAL this week, at page 170, is the Earl of Athlone, G.C.B. The other members of the Committee are Dr. H. J. Cardale, Chairman of the London Panel Committee; Sir Wilmot Herringham, K.C.M.G., M.D., a member of the University Grants Committee; Sir George Makins, G.C.M.G., late President of the Royal College of Surgeons of England; Sir George Newman, K.C.B., M.D., Chief Medical Officer, Ministry of Health and Board of Education; Sir Robert Newman, Bt., M.P. for Exeter; Sir Edward Penton, K.B.E., a member of the board of the Middlesex Hospital; Sir E. Cooper Perry, M.D., Principal Officer of the University of London; Mr. J. Dill Russell, F.R.C.S., late honorary secretary of the Hampstead Division of the British Medical Association; and Dr. T. W. Shore, Dean of St. Bartholomew's Hospital Medical School. The secretary is Mr. A. L. Hetherington, to whom all communications should be addressed at the Ministry of Health, Whitehall, S.W.

DR. JOSEPH CATES, M.O.H. for the county borough of St. Helens, has been appointed county M.O.H. for Surrey.

DR. G. S. TRAIL, on the occasion of his retirement after forty-three and a half years' active practice at Strichen, Aberdeenshire, has been presented with an inscribed silver salver, a gold watch chain, and a cheque for £130 by the inhabitants of the district.

VITAL STATISTICS FOR ENGLAND AND WALES, 1920.

WE are indebted to the Registrar-General for the following statement showing the birth rates and death rates and the rates of infantile mortality in England and Wales and in certain parts of the country during 1920.

ENGLAND AND WALES.

Birth Rate, Death Rate, and Infant Mortality during the Year 1920 (Provisional Figures).

	Birth Rate per 1,000 Total Population.	Death Rate per 1,000 Population (Crude Rate).*	Deaths Under One Year per 1,000 Births.
England and Wales	25.4	12.4	80
96 great towns, including London (populations exceeding 50,000 at the Census of 1911)	26.2	12.5	85
148 smaller towns (populations from 20,000 to 50,000 at the Census of 1911)	24.9	11.3	80
London	26.3	12.4	75

* The death rate for England and Wales relates to the whole population, but that for London and the groups of towns to the civilian population only.

The rates here shown are provisional, but any adjustment that may be found necessary will not affect the following points, namely: (1) That the birth rate for 1920 is the highest of the decade; (2) that the death rate is the lowest ever recorded; (3) that the infant mortality is the lowest ever recorded; (4) that the number of births is the highest ever recorded; (5) that the number of deaths is the lowest recorded since 1862, when the population was only 20 millions.

Medical News.

THE Ministry of Health has issued an amended notice with regard to substitutes for salvarsan which local authorities may supply to practitioners and the prices that may be paid. The names of the substances are: Arsenobillon and novarsenobillon (Messrs. May and Baker), diarsenol and neodiarsenol (Messrs. Allen and Hanburys), galyl (The Anglo-French Drug Company), kharsivan and neokharsivan (Messrs. Burroughs, Wellcome and Co.), and salvarsan (Messrs. Evans, Sons, Lescher and Webb).

PROFESSOR H. R. KENWOOD, C.M.G., will give an introductory lecture on Monday, January 31st, at 5.30 p.m., to students attending the courses of instruction at the Royal Sanitary Institute.

THE annual dinner of past and present students of the Royal London Ophthalmic Hospital will be held at the Café Royal, Regent Street, on Thursday, February 10th, at 7 for 7.30 o'clock. The chair will be taken by Mr. J. B. Lawford, Consulting Surgeon to the Hospital. Tickets, price 15s. (excluding wine), may be obtained from Mr. Charles Goulden, 42, Welbeck Street, W.1.

A SERIES of six post-graduate lectures and demonstrations in connexion with the Manchester Babies' Hospital will be held on Saturdays at 3.30 p.m., commencing February 5th. There is no fee for attendance.

THE annual dance of the Medical Society, University College Hospital, will be held in the Medical School Library on Monday, February 7th, from 9.30 to 2.30. Tickets, 15s., may be had from Mr. W. L. Spencer-Cox, honorary secretary, at the hospital.

DR. GEOFFREY EVANS has been appointed Assistant Director of the Medical Professorial Unit at St. Bartholomew's Hospital, and Assistant Physician to the Hospital. This appointment completes the staff of the unit, Dr. Francis Fraser having already succeeded Sir Archibald Garrod in the post of Director.

A SPECIAL meeting of the Council of King Edward's Hospital Fund for London was held on January 26th to consider the policy to be recommended to the Government for the preservation of the voluntary system of hospital management and control. The specific resolutions contained in a report of the Executive Committee were unanimously adopted, and ordered to be forwarded to the Prime Minister, the Minister of Health, and the members of the Government Committee of Inquiry into Hospital Finance.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2630, Gerrard.
2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard.
3. MEDICAL SECRETARY, *Mediscera, Westrand, London;* telephone, 2630, Gerrard.

The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin;* telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh;* telephone, 4361, Central).

QUERIES AND ANSWERS.

INCITAMIN OR FISCHER'S SOLUTION.

A CORRESPONDENT asks whether incitamin, an organic preparation devised by Professor Fischer of Copenhagen, is to be obtained in this country.

*** An article, in which Professor J. F. Fischer, an *x*-ray specialist in Copenhagen, described his solution, to which he has given the name "incitamin," although it is also known as Fischer's solution, was published in the *Ugeskrift for Laeger*, the journal of the Danish Medical Association, on December 2nd, 1920. According to this article the solution contains carbolic acid, serum and saliva (both in a modified form), and extract of pancreatic gland. Professor Fischer states that these ingredients are obtained from calves and horses, that the solution is colourless or faintly yellow and slightly cloudy, and that a deposit which formed on standing did not indicate any diminution in its potency. He tested its stability by keeping it for some time in a thermostat, and he has convinced himself that it is not toxic, provided it is properly applied. Originally he intended to continue his investigations of this preparation in modest obscurity, but he has changed his mind and put the preparation on the market, because he considered the final stage of its evolution had been reached, and that it was desirable that it should be manufactured under adequate supervision and on a large scale in order that it might be available to many investigators. It is prepared by the "Serpens" company, and is now obtainable from chemists in Denmark, but Professor Fischer does not mention the price. Much of his paper is concerned with clinical reports of hospital cases in which incitamin was used as a dressing for wounds and ulcers. In one of these cases a large ulcerating cancer of the back of the hand was treated, first with radium and then with *x* rays; the new growth was replaced by deep and extensive ulceration, which seemed an even more pressing indication for amputation than the original condition; the report of the case goes on to relate the triumph of incitamin. Almost equally dramatic are other records, several of which are of cases of varicose ulcer. The lay press in Denmark seized on this publication, hailing incitamin as the dawn of a new era, and so on. The incident drew from Dr. J. S. Möller a protest (*Ugeskrift for Laeger*, December 16th) under the heading "A New Arkanum." He writes: "Professor Fischer cannot have wholly forgotten that throughout the past years there has been waged a constant war through *Ugeskrift for Laeger* against secret remedies, a war, the provisional fruits of which are to be found in recent legislation . . . He must not, therefore, be surprised if one who has taken part in this war squirms when he reads the last number of *Ugeskrift* and the howl of advertisement which has gone up from the press." The same number of *Ugeskrift* contains a reply by Professor Fischer and a rather halting defence of the policy of the journal by the editors. No one familiar with conditions in Denmark and the high esteem in which the editors of *Ugeskrift* are held by their colleagues will question the motives by which they have been actuated in this matter, but it cannot be denied that the position brought about is unfortunate. The medical profession in this country may well await fuller and more precise information before using the solution.

BRAILLE TYPE FOR BLIND CHILDREN.

DR. ROBERT A. WELSH of Felton has under his care a child, aged 8, with an acquired hydrocephalus, first noticed at the age of 2 years. Five years ago, after a series of convulsions, the sight was lost. There is now a spastic condition of the legs, with great wasting, though the child can walk a little if helped. She is bright and intelligent, and can easily learn poetry and repeats what is read to her. Dr. Welsh asks whether it would be possible to teach the child to read by the Braille system, and, if so, the best age to begin.

*** We have referred this question to Dr. J. Lloyd Johnstone, Librarian to the National Institute for the Blind (224, Great Portland Street, W.1), who writes: "There is no reason why the patient should not, at once, commence to learn to educate the sense of touch in the fingers. As she appears to be an intelligent child she should soon be in a position to take up Braille. Children are instructed to read Braille at as early an age as letter-press. At the outset the sense of touch is educated by the use of small beads, and after the child has learned the 'feel' of these under the finger-tips, it is taught the Braille characters in large embossed type. All information as to books and apparatus may be obtained by writing to the Secretary-General, National Institute for the Blind, 224, Great Portland Street, W.1."

BLOOD CHANGES IN T.N.T. POISONING.

"W. B." asks for references to the literature dealing in detail with the symptoms and course of the anaemia caused by trinitrotoluene poisoning during the war. He especially wishes for records of the blood picture, marrow examination, and the subjective symptoms.

*** The symptoms and signs of poisoning by trinitrotoluene and other substances used in the manfacture of munitions are described in Dr. W. H. Willcox's Lettsomian lectures on jaundice, 1919, given before the Medical Society of London, and published in full in the BRITISH MEDICAL JOURNAL in 1919. Dr. Willcox has kindly added the following information: With regard to the blood changes in T.N.T. poisoning, a severe anaemia of pernicious type occurs in some cases, and this may be due to a combination of poisoning by T.N.T., and to bacteriological toxaemia from associated streptococcal infection from the mouth or intestine, the primary cause being the T.N.T. poisoning. The blood changes in T.N.T. poisoning were studied by Captain M. J. Stewart, R.A.M.C., and published in the *Proceedings of the Royal Society of Medicine*, January 23rd, 1917 (Discussion on Toxic Jaundice in Munition Workers), and also in the *Lancet*, January 27th, 1917. The symptoms and signs of cases of progressive anaemia following T.N.T. poisoning are similar to those of pernicious anaemia, and the treatment should be on the lines adopted for such cases.

DILATED PUPILS.

"C. F. R." writes: Miss B., aged 20, is a healthy girl of nervous energetic temperament. About ten years ago the right pupil, for no apparent cause, became widely dilated and has remained so. Two years ago the left pupil followed suit. Both pupils are now widely dilated—the left one being rather the larger. There is very slight reaction to an intensely bright light. There are no other physical signs. No enlarged glands are shown by *x* rays, and the blood is negative to Wassermann. With suitable glasses she can read for about half an hour, after which eye-strain causes severe headache. She has been seen by three consultants, who can throw no light on the cause or suggest treatment, though two of them—one a neurologist and the other an ophthalmic surgeon—have seen two similar cases, treatment being unsatisfactory. Any suggestion regarding cause or treatment would be gratefully received, as the girl is hopelessly handicapped by her condition and has been obliged to give up a university career.

INCOME TAX.

"TERRITORIAL" was called up in August, 1914, and served until December, 1918. In the spring of 1917 and 1918 he handed in to the local surveyor of taxes statements of such small amounts as were earned by colleagues on his behalf, and on each occasion was told that he would not be assessed as he was on active service. In July last he was asked to supply particulars of civilian earnings, and has now been called upon to pay £52 4s. tax thereon. He asks whether he has any redress.

*** Our correspondent seems to have legitimate ground for complaint in being told that he was not taxable and subsequently taxed; but we fear that the question will have to be

settled on the basis as to whether or not the charge is legal. On that ground he appears to have no redress, because such income as might accrue to him as a result of his civil practice is undoubtedly chargeable—on the basis of the amount receivable for each year of assessment. It might, perhaps, be worth while to ask for full particulars of the assessments made (unless they have already been supplied) and to make sure that all proper allowances have been made. We assume that for 1920–21 "Territorial" is assessed at the average amount of his civilian earnings in the years 1917, 1918 and 1919, and not, for instance, on the amount of his earnings for the first post-war year.

"E. A. Y." writes: Last January I bought a large practice (death vacancy) and was afterwards told that I must pay income tax on the three years' average earnings of my (deceased) predecessor. Is this the law, and how am I to find out this average?

*** That is the law subject to this proviso, that if the successor can prove at the end of the year that the profits have fallen short of the sum assessed through some *specific* cause, then the average figure can be displaced by the earnings of the year. Such earnings would have to be calculated not on the usual cash basis but on the value of the professional bookings. Our correspondent's only method of arriving at the average would seem to be from an examination of the books of the predecessor, though possibly the local inspector of taxes may have been supplied with some information as to the first two of those three years.

LETTERS, NOTES, ETC.

SURGERY OF THE ELBOW.

MR. R. ATKINSON STONEY, F.R.C.S.I., desires to make two corrections in the report which was sent to us of the discussion on the modern surgery of the elbow in the Surgical Section of the Royal Academy of Medicine in Ireland (January 8th, 1921, p. 48). The official reporter made Mr. Stoney say: "Before the war an ankylosed elbow was looked upon as a success, and excision for it was banned." The correct reading should be, "Before the war excision of the elbow for ankylosis was considered a successful operation, and an ankylosed elbow was considered a surgical failure; but now an ankylosed elbow is looked upon as a success, and excision for it is banned." In the reference, a few lines further down, to primary excision the words "employed by the inexperienced" should be omitted.

IMPROVED MOUTH GAGS.

DR. HARDING H. TOMKINS (Ealing) writes with reference to the mouth gag described by Major Black on January 22nd, p. 127: In 1884 I invented a gag upon much the same principle, so far as the non-cutting knife edge tooth plates go. My gag, however, was concave behind the knife edge. It was made for tube-feeding refractory lunatics, and could be introduced behind the molars; and I remember finding it of great value in the case of a man under anaesthesia whose mouth was spasmodically closed so that one could not get at his tongue. With this gag I was able to open his mouth, and, incidentally, to depress his tongue at the same time. The gag was made for me by Messrs. Maw, Son, and Thompson.

ANGIO-NEUROTIC OEDEMA.

DR. A. BERNHARD-SMITH (London, S.W.) writes: Some further account of the case of wandering or angio-neurotic oedema which I published (with a photograph of the patient) in the BRITISH MEDICAL JOURNAL of June 8th, 1901, may be of interest. The father was somewhat gouty, to my knowledge; but neither the patient nor his brother and three sisters have shown signs of gout. There is no history of epilepsy in the family. Some years ago one sister had a single, severe attack of angio-neurotic oedema following dysentery (see a somewhat similar case reported by E. W. G. Masterman, F.R.C.S., BRITISH MEDICAL JOURNAL, April 3rd, 1897); but my patient's oedema, which during 1896–98 was treated with arsenic, iodides and ointments, and special dieting, although no hypodermic injections of serum were given, seems to have worn itself out, as he has not since had a return of the trouble.

TAPEWORM.

DR. J. REID (London, W.C.) writes: Dr. Low's case and treatment in the BRITISH MEDICAL JOURNAL of January 22nd may excuse me for recording an experience. A lad of about 15, a worker on the land, had suffered and been treated without effect for about a year. I gave him a mixture containing 2 drachms of the liquid extract of male fern with an emulsion of castor oil and tragacanth in a 6 oz. bottle, one-twelfth part every four hours. The worm was brought to me, with its head, in a few days. My rationale depended on a desire to keep the *worm* constantly fed with the filix mas. Filicic acid or isobutyryloxynaphtho-quinone is not to be given with castor oil on account of its poisonous qualities (Squire). Like dillenic acid, from *Hibbertia volubilis*, which kills the earthworm after a convulsion, it is insoluble in water and soluble in alkali, hence probably it becomes efficient as a vermicide.

DANGEROUS DRUGS ACT.

MR. A. E. CLEARE, pharmacist of Uckfield, in the course of a letter on this subject expresses the opinion that at the present time anyone can obtain the most dangerous poisons with little or no difficulty, whether for felonious purposes or not. Self-medication, he states, particularly amongst women, is alarmingly on the increase. Not so many years ago the number of drugs which found their way into domestic use were few, and consisted of such harmless things as Pil Rhei Co., Conf. Sennae, Mag. Sulph. But to-day custom has changed. The public seem to have become familiar with the latest drugs, without, of course, understanding their therapeutical properties. I think, he says, the popularity of the tablet has much to do with it; I have found amongst many people a belief that if a drug is in tablet form it must be harmless. When the Dangerous Drugs Act becomes operative, it will not, Mr. Cleare thinks, be effectual in the purpose for which it is intended unless effective measures are introduced to make it so, any more than the Pharmacy Acts of 1868 and other dates have prevented poisonings from taking place. Any law must, to be effective, be provided with the means to carry it out, and therein lies the crux of the whole thing. I do not of course suggest, he continues, that the Pharmaceutical Society is incapable of carrying out whatever new regulations may be made, but the fact remains that in the past regulations with regard to the sale of poisons have been most ineffective. In spite of the regulations being plain and concise—on paper—it has been left, in many ways, to the individual shopkeeper to interpret them according to his individual discretion, and while many—I am glad to think, the majority—have acted conscientiously and well, there are others who practically ignore every restriction that is put upon them, and those the Pharmaceutical Society certainly does not appear to have reached. In general the chemist in small country towns and the back streets of Suburbia is the worst offender, because, knowing his customers personally, he is pretty safe from interference.

THE Food Education Society has issued its report for the past year. A copy of this, together with a list of publications and particulars of lectures and cookery demonstrations, may be obtained for 7d., post free, from the society (Danes Inn House, 265, Strand, W.C.2).

A PLEASANT little adjunct to the treatment of the neurotic child is the "Sleepy Dustman" lamp and night-shade, designed by the wife of a medical man. She tells us it has been of great service in helping to calm the bedtime terrors of nervous children, who cannot bear to be left alone in the dark. It is now made by the Artistic Shade Company, 146, Kensington High Street, W.8, and there is a little story book with verses and appropriate music to reinforce the suggestion of the lamp-shade.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 31, 34, 35, 36, and 37 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 32 and 33.

THE following appointments of certifying factory surgeons are vacant: Bridge of Weir and Kilmacolm (Renfrew), Portadown (Armagh), Strichen (Aberdeen).

A VACANCY is announced for an ophthalmic specialist medical referee under the Workmen's Compensation Act, 1906, for County Court Circuit No. 4, comprising the Bacup and Rawtenstall, Blackburn and Darwen, Blackpool and Fleetwood, Clitheroe, Garstang, Haslingden and Accrington, Kirkham, Preston and Chorley, and Lancaster County Courts. Applications should be addressed to the Private Secretary, Home Office, by February 16th.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line...	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste-restante* letters addressed either in initials or numbers.